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BALTIMORE'S MUNICIPAL SOLID WASTE MANAGEMENT SYSTEM; A CASE STUDY

Applied Management Sciences, Incorporated

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1973

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BALTIMORE'S MUNICIPAL SOLID WASTE MANAGEMENT SYSTEM

A Case Study

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FOREWORD

Solid waste management systems are an integral part of the environment of nearly every citizen in the United States. Yet until recent years, these systems have not received the attention other visible residential services have enjoyed. This historical neglect has resulted in systems which may not be cost-effective, especially with respect to the rising cost trends encountered in solid waste management activities. These trends arise from two principal factors:

* Environmentally sound disposal methodology is being enforced or strongly encouraged; as a result, disposal sites and needed equipment are now expensive to procure and operate; and,

* The collection function is highly labor intensive. Thus, the costs of unskilled labor, which have been rising to meet socioeconomic demands, have had enormous impacts on local agency budgets.

This rise in cost pressure has forced all levels of governmental organizations to consider more closely the management and costs of solid waste management activities.

Because efforts to upgrade solid waste management practices are in their infancy, there is still an obvious lack of data bases for evaluative and comparative analyses. This case study is one in a series of case studies of solid waste management systems which has been conducted under the sponsorship of the Office of Solid Waste Management Programs, U. S. Environmental Protection Agency. Kenneth Shuster and Cindy McLaren served as EPA project officers on the case study reported herein. The purpose of these case studies is to fill in this data gap with actual case histories of how cities are handling their solid waste problems.

Concerned agencies at all government levels, as well as private firms, will be able to access information of the following types:

* The management and operating characteristics of public sector solid waste management systems.

* The institutional forces which give rise to these characteristics.

* Those techniques that have been or are being applied to enhance the measures of productivity, aesthetics, level of service, and environmental control.

These agencies and firms can then use these comparisons to upgrade their systems according to the norms achieved in other cities of similar size, geographical location, and operational and institutional characteristics.

--ARSEN J. DARNAY
Acting Deputy Assistant Administrator
of Solid Waste Management
Office of Solid Waste Management Programs

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INTRODUCTION

The solid waste management system operated by the City of Baltimore, Maryland is designed to respond to the characteristics unique to the metropolitan area. There are a number of significant pressures affecting both the collection and disposal functions and, consequently, the system is highly adaptive.

Presently, the collection function is orientated so that in the event that additional services are required, the manpower and equipment allocation is adjusted to meet the new demand. This characteristic is especially apparent in the shift of collection personnel and equipment from point collections to street cleaning activities. There is a rapidly growing litter problem in the city due to citizen apathy and inadequate waste storage, and the city has responded to these factors by increasing solid waste management activities rather than by more effective regulatory control. Due to the prevailing socioeconomic and political climate, this type of response is the only realistic alternative. However, system management personnel recognize the nature of the problem and are seeking alternate methods of solution.

The disposal function has also been hampered by local conditions common to many larger and older urban areas. Baltimore is entirely bounded by more affluent suburban communities. Under this circumstance, it is not feasible to secure suitable disposal sites in these suburban areas and it is very difficult to even transport waste to more remote sites by passing through these communities. Consequently, the disposal function in Baltimore has become an intricate balancing process. This problem, however, appears to be on the verge of solution due to the success of an application to the Environmental Protection Agency for a resource recovery grant. The new disposal system that will result from this grant will have facilities for energy recovery by means of pyrolysis and ferrous material recovery by the use of magnetic separators. The energy, in the form of steam, will be sold to the company that provides heat for many downtown buildings. Other recovered materials will be sold to suitable markets.

If the new disposal facility is as successful as projected, a significant pressure will be removed from the solid waste management system. This condition may result in greater freedom for the system management to address other pressing problems associated with the collection function. It is likely that the next problem to be addressed will be control of the accelerating litter problem, an expensive collection operation for the city.

This case study of Baltimore, Maryland was performed by using a carefully structured data gathering technique. Initial contacts were made by both Office of Solid Waste Management Programs and Applied Management Sciences personnel and interviews were scheduled to be convenient for the city personnel. During these interviews, notes were taken and tape recordings were made after obtaining the permission of the interviewees. Extensive efforts were taken to require a minimum of city personnel time and whenever possible, existing documentation was solicited to support the general discussions. Figure 1 presents the titles of the people interviewed in Baltimore, the dates of these interviews, and the types of information obtained.

The structure of this report consists of five chapters, including the introduction. Chapter 2 is a systems description abstract which synopsizes the characteristics of the city and the collection and disposal systems. Chapter 3 presents the findings of the case study effort and identifies potential problem areas. Chapter 4 is a description of the city in terms of those parameters which can affect solid waste management operations. Finally, Chapter 5 reports the characteristics of the solid waste system in considerable detail. All aspects of the system are discussed and appropriate tabular data are presented.

TITLES	DATE	INFORMATION TYPE
Technical Services	24 Oct	General System Characteristics
Director, Division of Sanitation	24 Oct	General System Characteristics, Problems
Public Works Personnel	25 Oct	Some Manpower Data
Administrative Assistant, Division of Sanitation	25 Oct	Manpower, Collection Specifics, Disposal Specifics
Senior Management Analyst, DPW	25 Oct	Financial Data; Budget & Expenditures
Director, City Accounting	27 Oct	Financial Data; Capital Expenditures
Training, DPW	27 Oct	Types and Frequencies of Training Programs
Assistant, M. V. and Mechanical Shops	27 Oct	Equipment Maintenance Policies
President, Local #44	31 Oct	Labor's Perspective of SWM in Baltimore
Division Chief, M. V. and Mechanical Shops	31 Oct	Equipment Maintance and Fiscal Policies
Head, Baltimore Department of Health	31 Oct	Health Aspects of SWM Practices
Director ,ADP	2 Nov	Specific Equipment Data
Labor Commissioner	2 Nov	Interface of City and Union
Former President, Women's Civic League	2 Nov	Nonpartisan Comments of SWM in Baltimore
Deputy Director, Model Cities Program	2 Nov	Service as Viewed by Model Cities Administration
Head, Workman Compensation Bureau	2 Nov	Injury Frequency & Cost Data

FIGURE 1: DATA SOURCES AND INFORMATION TYPES

2

SYSTEM DESCRIPTION ABSTRACT

City: Baltimore, Maryland

Contacts:
Robert Deitrich - Technical Services
Edward Moore - Director, Division of Sanitation
Thelma Miller - Public Works Personnel
Sally Murphy - Administrative Assistant, Division of Sanitation
Theodore Stockus - Senior Management Analyst, DPW
Frank Mucha - Director, City Accounting
Wallace Shindler - Training, DPW
Thomas Ostendorf - Assistant, M. V. and Mechanical Shops
Raymond Clarke - President, Local #44
Eric Fredrick - Division Chief, M. V. and Mechanical Shop
Dr. Farber - Head, Baltimore Department of Health
Harold Tall - Director, ADP
Robert Hillman - Labor Commissioner
Mrs. Innes - Former President, Women's Civic League
Lloyd Mitchner - Deputy Director, Model Cities Program
Tom Miller - Head, Workmen's Compensation Bureau

Dates Visited: October 24, 25, 27, 31; November 2, 1972

Population Demography:
1970 - Total - 906,000; White - 53.5% Other - 46.5%
1960 - Total - 939,000; White - 65.3% Other - 34.7%
1950 - Total - 950,000; White - 76.2% Other - 23.8%

Area: 78.3 Square Miles

Density: 11,568 residents per square mile

Mileage: Roads - 2000 miles

Alleys - 500 miles

Collection: Table 1

Miscellaneous: The manpower allocation to mixed residential collection and street sweeping activities are about 400 and 800 men, respectively. The size of the street sweeping staff is said to be necessary because of an apparent rise in street litter. The stated lack of sufficient containers in the city supports this reason. The Department of Health has prohibited the use of plastic refuse containers which may contribute to this problem.

Disposal: Table 2

Miscellaneous: The Monsanto Pyrolysis machine is expected to come on line in 1975. The newer of the two existing incinerators will be upgraded. Regional disposal plans have not met with popular acceptance.

TABLE 1

COLLECTION SYSTEM CHARACTERISTICS SUMMARY

Collection Function Collection Variables	Mixed Refuse	Gang Sweeping (hand & machine)	Beat Patrol (Individual men)	Bulk Collection	Ash Collection	Market Cleaning and Collection
Number of Routes	92[1/]	88	174 carts plus 13 trucks	11	6	1
Crew Size	M, T, W - 4 Th, F, S - 3	5.5 +29 equipment op.	1 plus 40 support	3	6.5	14 men assigned to 6 locations
Frequency of Service	2/wk	Roads: 2/wk Alleys: 1/wk	Continuous	2/mo but by appointment	1/wk	daily
Point of Collection	Curb or Alley	Curb	Curb	Curb	Curb	Not Applicable
Method of Collection	None Specified	Sweeping by machine or hand	Hand sweeping of gutter by one man	Liftgate Trucks	Hand load trucks	Compaction unit truck and dumpster containers
Stops	300,000 Dwellings	Not Applicable	Not Applicable	300,000 Dwellings	Changing (dropping)	6 Locations

[1/] Cut back to 90 crews in early 1973

Page 1 of 3

TABLE 1 (Continued)

Collection Function / Collection Variables	Mixed Refuse	Gang Sweeping (hand & machine)	Beat Patrol (Individual men)	Bulk Collection	Ash Collection	Market Cleaning and Collection
Service Limitations	Four 20 gallon containers/stop - No Plastic Containers	Residents are required to keep property and walks clear of waste	Same as Gang Sweeping	Three items per pick-up	eight 10 gallon containers per pick-up	None
Incentive System	Task	No (usually relieved during wet weather)	No (Same as gang cleaning)	No	No	No
Fund Source	General Fund	Motor Vehicle revenues from State	Motor Vehicle revenues from State	General Fund	General Fund	General Fund
Tonnage	1350 TPD	336,498 yards per year shared with Beat Patrol	Shared with Gang Sweeping	63,978 yards per year	26,329 yards per year	8,541 tons per year
Wage Scales (Hourly)	Driver - $3.53 Helper - $3.29	Leader - $3.53 Driver - $3.25 Helper - $3.14 Eq. Op. - $3.87 (Mech. Broom)	Driver - $3.53 Helper - $3.14 Cartman -$3.14	Driver - $3.53 Helper - $3.14	Driver - $3.53 Helper - $3.14	Foreman - $3.53 Driver - $3.25 Helper - $3.14
Unions	AFSCME Local 44	Same	Same	Same	Same	Same

TABLE 1 (Continued)

Collection Function / Collection Variables	Mixed Refuse	Gang Sweeping (hand & machine)	Beat Patrol (Individual men)	Bulk Collection	Ash Collection	Market Cleaning and Collection
Annual Cost	$4.572 Million	$6.009 Million shared with Beat Patrol	Shared with Gang Sweeping	$321. Thousand	$258. Thousand	$217. Thousand
Comments	Efficient at about 4.2 tons/man/day including the driver Total manpower is 414 men	Total manpower is 515 men	Total manpower is 224 men		This function is undergoing a work force reduction because of decreasing ash generation rates	This function is not common among cities

TABLE 2
DISPOSAL SYSTEM DATA

Disposal Site Disposal Data	1	2	3	4	5
Type	Incineration	Incineration	Landfill	Landfill	Landfill
Capacity	700 TPD	700 TPD	500 TPD	525	100
Real Loading	450 TPD*	700 TPD*	500 TPD	525	100
Expected Lifetime	0+	NA	3 years	1.5 years	Zero
Operating Costs	$670,636/yr	$1,056,147/yr	$273,584/yr		
Start-up costs	NA	NA	NA	NA	NA
Location	201 Reedbird Avenue	6709 Pulaski Highway	201 Reedbird Avenue	Bowley's Lane	Coldspring Lane

*Based on a 300 day year

3

FINDINGS AND CONCLUSIONS - MAJOR PROBLEM AREAS

The present solid waste management system of Baltimore has evolved through a series of issues, which have served to shape and structure the system. While these issues and events may appear to be mutually exclusive, they are in fact quite interrelated. For Baltimore City, the following problems or issues have been identified as having a major impact upon the present solid waste management system.

- Lack of adequate storage containers
- Lack of citizen cooperation
- Disposal problem
- Rising cost pressures
- Labor management relations

Each of these problem areas will be developed individually so as to more fully describe the total impact of each area on the system.

3.1: Lack of Adequate Storage Containers

The Baltimore City Code (Sec. 3, Article 23, Appendix A) limits the amount of mixed refuse to the contents of four twenty-gallon containers and all straight garbage in containers of ten gallons or less, at any one stop. This Ordinance was originally passed to protect the workmen from lifting excessively heavy trash containers. Another important restriction, promulgated by the city's Department of Public Health in 1957, required that all containers be made out of metal and have tight-fitting covers. Plastic containers were rejected by the Department because their laboratory and field tests demonstrated that hungry rodents could gnaw their way through the container's sides. Therefore, in the interest of public safety and health they outlawed plastic containers. These two constraints, individually and collectively, have had a profound influence upon the amount of waste collected by the mixed refuse crews and the level of services provided by the city.

The statutory limit on the size of trash containers forces residents to purchase more containers than would otherwise be necessary. This has had its harshest effects upon inner city residents who can ill afford to purchase many containers at today's inflated prices. The price of an average twenty gallon metal container ranges between five and nine dollars. Thus, the cash outlay for an average size family could range anywhere between $5 (one of the cheapest containers) and $36 (four heavy duty containers). The Department of Public Health's ruling has added to this problem. By eliminating a potentially lower-priced and more durable product, the plastic container, it has increased citizen cost. At the same time the tests run in 1957 have come under attack. Other, more recent tests have shown plastic containers to be equally resistant to rodent attacks as metal cans. In addition, the plastic lids generally fit tighter than metal tops after continuous use because of their greater flexibility.

The result of these decisions, as well as other sociological and demographic factors, has been a large increase in the amount of vagrant waste (street refuse) over the past few years. While the amount of mixed refuse collected has remained at approximately the same level for the past five years, the amount of vagrant waste has increased significantly. This has forced the city to form additional street crews to handle this problem. (The types of crews and their functions are discussed in Chapter 5). Associated with the vagrant waste problem there has been an increase in the rodent population of the city. As will be shown in the next section, these problems are particularly acute in certain areas of the city.

3.2: Lack of Citizen Cooperation

The apparent apathy and lack of cooperation by segments of the populace is evidenced by the lack of proper storage containers in certain areas of the city. The Director of the Division of Sanitation estimates that in certain areas of the city there are only forty containers for every sixty dwelling units -- a ratio of less than one container per dwelling. While collection does occur twice a week, this situation is far from being adequate or sanitary. Also it helps to explain the large amount of vagrant waste which is found in these areas as citizens, lacking proper storage containers, discard their waste in the alleys and streets.

The Model Cities Program of Baltimore, recognizing the need for increased sanitary conditions in the very low income areas of the city, has funded the Division of Sanitation to provide additional sanitation services to Model Cities areas. These additional services include:

1. Handsweeping and cleaning three times per week of all street gutters, sidewalks, and all public and private alleys;
2. Collection once per week on a regularly scheduled day of all bulky items of trash set out for removal without need for special request to the Sanitation Division (usually made by phone calls);
3. Cleaning as needed of all vacant lots, many of which are city owned;
4. Mechanical flushing once per week of all streets;
5. Emptying four times per week of all corner trash receptacles (i.e., wire baskets).

While these services have generally improved the living conditions in the area, major problems still remain. A few blocks within these areas have achieved what may be designated as "block pride". They have attempted to maintain a proper sanitation level by encouraging their residents to practice sound waste storage techniques. At the same time, however, other citizens take advantage of the system's additional services. They discard their wastes (trash, garbage, and bulky items) directly in the alleys, knowing it will eventually be picked up by the sanitation crews. Also, residents have been found to make unfair requests of the men at times, by asking them to perform special tasks for which they are not responsible. These negative aspects of the program, however, do not overshadow the sanitation and health benefits which this program provides to the community.

One other program, which runs congruent with the sanitation program, is an attempt to educate the residents of the area to the problems of sanitation and health. Members of the Model Cities Program have tried to illustrate the direct correlation between unsanitary health conditions and the vermin population but they have met with very limited success. Many residents are apparently unconcerned about scattered trash and improper storage facilities. Unfortunately, these residents directly influence the living conditions and sanitation level in the entire neighborhood.

3.3: Disposal Problem

A significant problem area facing Baltimore is its disposal of solid wastes. There are two incinerators (forty and sixteen years old) and three landfill sites. The newer incinerator will be upgraded to meet air pollution standards but the older machine is beyond salvage. The landfill sites are rapidly nearing their capacities. The city is ringed by suburban communities that are not enthusiastic about the potentiality of being used as disposal sites. Furthermore, the transportation of solid waste across jurisdictional boundaries is also proscribed.

There are two events that have affected disposal planning in the city. The first of these is the approval of plans to construct a 1000 TPD pyrolysis incinerator using federal, state, and city funds. This plan will dispose of nearly half of the city waste by 1975 with the remainder being incinerated in the upgraded machine (900 TPD) and landfilled (150 TPD). The second event is the state requirement to produce a Regional Solid Waste Management plan. Such a plan may result in either the procurement of disposal sites in surrounding areas or the implementation of a rail haul system to remote sites.

Baltimore would probably be receptive to a regional disposal plan at this time because it would save the city the cost of the repair and refit necessary to upgrade their newer incinerator. However, if there is considerable delay in the implementation of such a system, the city would be forced to carry out their original plan and would not wish to add to their costs by regional involvement.

Either way, however, the waste will be disposed. The question of how and the costs to do so have yet to be resolved. It is evident that the new pyrolysis plant has taken considerable pressure off the city and the remaining decisions to be reached will be made with careful thought as to their long-range impacts.

3.4: Rising Cost Pressures

A critical issue is a problem familiar to many central cities in our overstressed economy. The tax base in many cities is dropping while costs continue to rise. Revenue sharing may ultimately provide relief to our central cities, but currently they generally face severe financial pressures. Baltimore is no exception to this common situation. A complete description of the tax base and property tax rates is presented in the financial section of Chapter 5, but it is necessary to note that the city has financial difficulties.

The rising cost of labor and capital has forced the city to trim its budget. The mixed refuse collection expenditures ran a deficit of approximately $300,000 in the fiscal year 1971-72, yet the same budget was trimmed for the fiscal year 1972-73. Earlier, in the fiscal year 1968-69, the city diverted Motor Vehicle funds into its street cleaning budget in order to alleviate the cost pressures in the sanitation budget. The source of these Motor Vehicle Funds are state-collected gasoline taxes, titling fees, and license plate fees. This fund has become the major source of revenue for the Sanitation Division.

Because of the cost pressure, the Division of Sanitation has had fairly heavy reliance on federal and state funds for major capital expenditures. The new pyrolysis disposal plant is an example where the Federal Government supplied $6 million dollars and state aid accounted for $4 million dollars of the proposed $13-$14 million dollar project. On a much smaller scale, the Environmental Protection Agency funded a study on the feasibility of installing a transfer station in the northwest section of Baltimore. The actual funding for the proposed transfer station was achieved through a recently passed bond issue.

3.5: Labor-Management Relations

Prior to 1968, labor did not present a problem to Baltimore's solid waste management system. The four-day strike in September 1968, changed the previously placid relationship between labor and management. The strike resulted in a 7.5 percent wage increase for blue collar workers (white collar stayed at 5.0%) and, more importantly, the unions gained the rights to collective bargaining.

Since the strike, AFSCME has been able to gain further benefits from the city. Wages have increased considerably and the city now pays for nearly all medical and health benefits. In the upcoming negotiations, the union will try to obtain free annual medical examinations for the sanitation workers, an increased annual wage, and total payment of pension premiums by the city.

The current relationship between the union and the Sanitation Division management is very good with both sides still respecting and trusting the other. There exists both a formal and an informal grievance procedure for airing any disputes. Generally, both union and management prefer to use the informal procedure. A prime reason for the use of the informal procedure is the amount of time it takes to have a formal complaint processed. This can take up to one and one-half months during which the worker may be out of work and thus without pay. A second reason, no less important, is the background of the Chief of the Sanitation Division. He started as a general laborer with the mixed refuse crews. Consequently, he is sympathetic to the worker's problems and the union feels they will gain fair treatment by him.

While a generally harmonious relationship exists between the two opposing camps, there are many minor irritations which exist. One particularly distressing problem to the Sanitation Division is the high turnover and absenteeism rate. The continual absence of a portion of their work force compels management to carry a larger labor force than would otherwise be necessary. It also increases the indirect costs of labor as sick leave costs and Workmen's Compensation costs are high. Management believes that Workmen's Compensation has been abused in the past few years. A review of the cost figures for the past two years has shown a substantial increase in these figures, all of which cannot be attributable to increased medical costs. One program instituted to cut back on the amount of sick leave taken allows a worker to exchange 3 days of sick leave for one day's pay with a maximum of 12 sick leave days per year. This program has had only limited success.

A potential source of labor problems is the current city policy of turning back unskilled laborer jobs in the street cleaning activities. This process is being performed by attrition rather than by large scale lay-offs, and the union has stated that they are not particularly distressed about this matter. This may not be realistic inasmuch as a loss of constituents will affect union finances and, perhaps, union influence.

Another source of labor discontent is the alleged condition of the equipment which they are forced to use. The union feels that the equipment is inadequately prepared and maintained. At the same time, however, management complains that the workers do not take proper care of the equipment. Central garage officials voiced the opinion that the workers abused the trucks and other equipment. This dispute has not been resolved, but undoubtedly the claims of both sides have some degree of merit.

At present, the wages and benefits appear to be reasonable remuneration for the work performed. It is clear, however, that as costs increase and budget constraint trends continue, the union may be less inclined to be cooperative and the demands may put more financial pressure on solid waste management activities. Such a condition works negatively in that higher demands make the adaption of innovative technology less likely until crisis situations force resolution of the issues. Fortunately, it appears unlikely that catastrophic failure of operations is an impending event because the principals of both the union and the Division of Sanitation have a good working arrangement. A gradual deterioration of good will is more likely.

The most probable system, given no internal or external changes, will be one in which an equilibrium of sorts will be reached. The workforce will continue to shrink by attrition but the costs per unit labor will rise so that the total labor costs will remain relatively constant. The result of this process is likely to be a lower level of service.

On the other hand, the system will probably not be immune to changes. For example, a decision could be reached concerning the container problem resulting in a reduction of street wastes. In this case, the equilibrium suggested in the preceding paragraph would not result in a reduction of the level of service.

The relationships between these major problem areas are illustrated by Figure 2.

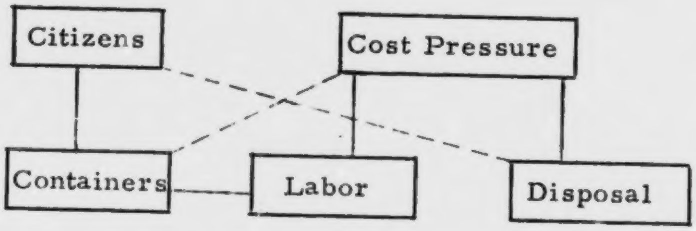

FIGURE 2: PROBLEM AREA CONNECTIVITY

Major relationships are represented by solid lines and indirect relationships by dashed lines. There is certainly a link between "citizens" and "disposal", but at this time it is strong only when residents exterior to the city limits are included. Similarly, there is a relationship between "containers" and "cost pressure", but again, it is strong only in the sense that cost pressure can be reduced by proper containerization. The stronger link would be through labor. It is clear that a shift in policy in any problem center will have significant effects on the others. For the most beneficial effects, the question of which problem to address needs to be answered.

Of the five problem areas identified, the citizen apathy and the storage situation seem to be the most important at this time. The solution of either or both will significantly reduce the vagrant waste found in the city. The solution to citizen apathy will have the greatest beneficial impact, but because the burden of implementation is mostly external to the solid waste management system, it may be the most difficult to initiate. The remaining problems have considerable inertia and solutions to these will yield results that will take time to observe. The amount of lead time available to the city is not known, but is suspected to be less than a decade.

4

BACKGROUND OF THE SYSTEM

Incorporated in 1797, Baltimore is an old middle eastern city which is the hub of Maryland's economic activity. It lies on the western shore of the Chesapeake Bay, midway between northern and southern extremes, and forms one corner of a major metropolitan triangle with Washington, D.C., and Annapolis, Maryland. Regionally, the Baltimore Standard Metropolitan Statistical Area consists of over 2 million people living within the city and in the counties of Anne Arundel, Baltimore, Carroll, Harford, and Howard. Baltimore City's boundaries include the nation's third largest port in terms of tonnage and provides living space for 902,000 people, the largest city population in the state. It is the largest financial center in the area and has a heavy concentration of research and development facilities. Baltimore is the site for diversified manufacturing markets, including ships, missiles, steel, electronic devices, and transportation equipment. It is noted for its textiles, clothing, spices, processed foods, and alcoholic beverages. It is also a center for the processing of copper and bichromate.

While Baltimore lies at one end of a rapidly developing corridor which stretches to Washington, it is not a city without major difficulties. The population has dropped by 47,000 since 1950, and there is growth in its black population with an accompanying suburban population shift. Thus, the tax base is weakening, while the demand for services and related labor costs has increased. It is the site of extensive model city program efforts to rebuild and revitalize the city. Downtown Baltimore is experiencing a rebirth keyed around the Charles Center and the City Hall Plaza. Virtually all of the central business district will eventually be rebuilt. Not the least of Baltimore's problems center on sanitation. There is a solid waste disposal problem created by insufficient incineration and landfill sites, increasingly stringent pollution controls, and the inability to procure disposal sites outside the city limits. The Sanitation Division also has problems in the areas of employee turnover and a lack of chauffeurs (truck drivers). Finally, population shifts, packaging trends, insufficient storage, and other physical constraints have created a marked increase in street refuse, making it more difficult for Baltimore to maintain its relatively clean appearance.

4.1: Location, Geography, Demography, and Climate

The corporate limits of Baltimore include seventy-nine square miles of land area and seven square miles of water. The city was separated from Baltimore County in 1851 and received a home rule charter in 1918. The Port of Baltimore is the nation's third largest in terms of foreign trade tonnage.

The City of Baltimore has experienced significant population shifts in recent years. As in many major metropolitan areas, the more affluent have moved from the city to suburban areas. The white population decreased by 259,100 while the black population rose 211,400 between 1950 and 1970. While the SMSA as a whole has increased in population from 1,457,200 in 1950 to 2,097,900 in 1971, Baltimore's population has declined from 949,700 to 902,000 in the same period. During this interval, real estate tax rates for Baltimore have risen from $2.88 per $100 of assessed valuation to $5.65. Also, receipts from state funds have increased significantly. Employment for Baltimore has increased by 21.7 percent since 1950; however, employment growth for the SMSA has increased 52.7 percent in the same period. The number of companies within the city fell from 1,629 to 1,385 during this interval. Unemployment has remained relatively stable at about 5.2 percent. Baltimore has designated six square miles of "Community Action" Areas because of low income, crime, and unemployment factors. These areas include most of the older parts of Baltimore and ring the central business district.

For the SMSA as a whole, Anne Arundel County's population increased by 161 percent, Baltimore County by 133 percent, Carroll County by 58 percent, Harford County by 132 percent, and Howard County by 182 percent. The white exodus to the suburbs, as well as the normal population growth, have clearly defined the suburban area as the site of future and continued growth. The developing City of Columbia in Howard County, for example, is indicative of the recent and future growth patterns -- an escape from the blighted urban centers.

Baltimore's climate is moderate. Rainfall is uniformly distributed throughout the year and averages 40.20 inches. Snowfall averages 25.25 inches per year and is heaviest in December, January, and February. Snowfalls over one inch average only nine days per year. Glaze or freezing rain occurs two to three times per year. Temperatures average a high of 88 during the summer and a low of 24 during the winter. In general, the weather is not severe in either summer or winter.

4.2: Form of Government and Organization

4.2.1: Form of Government

The elected leadership of the City of Baltimore is comprised of a Mayor, the Comptroller, the President of the City Council, and 21 members of the City Council. The first three officers are elected city-wide, while there are three Council members elected from each district. In Baltimore, the charter, as modified in 1967, establishes a strong mayor-weak council form of government. The Mayor now has the authority to make over 300 appointments, which includes the heads of city departments and the members of the boards and commissions that govern city agencies.

The Board of Estimates formulates and determines the city's Ordinance of Estimates, or budget. The Board is comprised of the Mayor, the City Solicitor, the Director of Public Works, the Comptroller, and the President of the City Council. Since the Mayor appoints both the Solicitor and the Director of Public Works, he essentially controls the city's financial policy. The Board of Estimates is also responsible for awarding contracts, supervision of purchases, and the establishment of salaries and wage rates.

The Mayor controls the Commissioners of Finance. This Commission has the authority to issue and sell bonds, make temporary loans, control the City Sinking Fund, and select depositories for city funds. The Mayor may also veto legislation of the City Council and can be overridden only with a three-fourths vote of the entire membership.

4.2.2: Organization

The municipal organization (Figure 3) illustrates a normal organization structure for large cities. Various commissions oversee the activities of "line" departments. The Department of Public Works' organization is shown in Figure 4. The Department was organized in 1925, but its present form, a consolidation from ten bureaus into five, was created in 1968 by passage of a City Ordinance in 1967 which approved a City Charter change and resulted in the strong-mayor form of government.

The Department of Public Works has five Bureaus under the authority of the Director of Public Works, who is also one of the five members of the Board of Estimates. The Department is the only "line" or services-oriented department represented on this powerful Board. The Sanitation Division is also the largest city employer in terms of manpower. The Sanitation Division (Figure 5) is one of three divisions in the Bureau of Utility Operations. Its chief, appointed in 1966, has been with the Division for 35 years. It is interesting to note that, besides assistant superintendents for collection, street cleaning, and disposal, there are also superintendents for the Model Cities area and for the Central Business District.

4.3: Solid Waste Management System History

By 1959, the current collection and disposal operation of the Sanitation Division were essentially fixed. Two incinerators plus landfills were in existence. The two existing incinerators are in the Eastern and Southwestern sections, yet the bulk of the residential population is in the Northwest section. In November of 1962, voters rejected, by a 3 to 1 vote, a referendum for a bond issue for a new incinerator. In December of 1962,

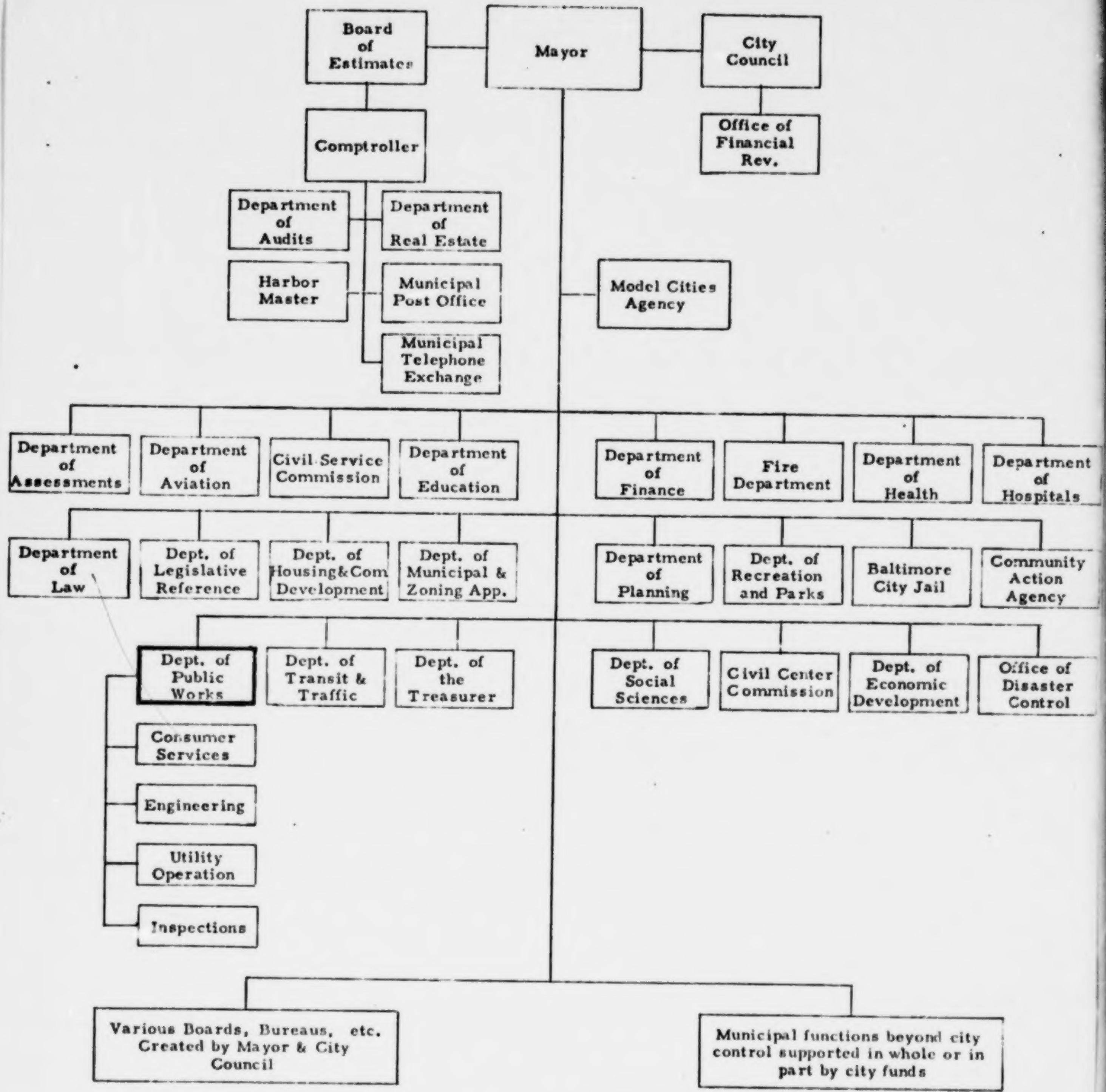
Board of Estimates
Mayor
City Council
Comptroller
Office of Financial Rev.
Department of Audits
Department of Real Estate
Harbor Master
Municipal Post Office
Model Cities Agency
Municipal Telephone Exchange
Department of Assessments
Department of Aviation
Civil Service Commission
Department of Education
Department of Finance
Fire Department
Department of Health
Department of Hospitals
Department of Law
Dept. of Legislative Reference
Dept. of Housing&Com Development
Dept. of Municipal & Zoning App.
Department of Planning
Dept. of Recreation and Parks
Baltimore City Jail
Community Action Agency
Dept. of Public Works
Dept. of Transit & Traffic
Dept. of the Treasurer
Dept. of Social Sciences
Civil Center Commission
Dept. of Economic Development
Office of Disaster Control
Consumer Services
Engineering
Utility Operation
Inspections
Various Boards, Bureaus, etc. Created by Mayor & City Council
Municipal functions beyond city control supported in whole or in part by city funds

FIGURE 3: MUNICIPAL ORGANIZATION - CITY OF BALTIMORE

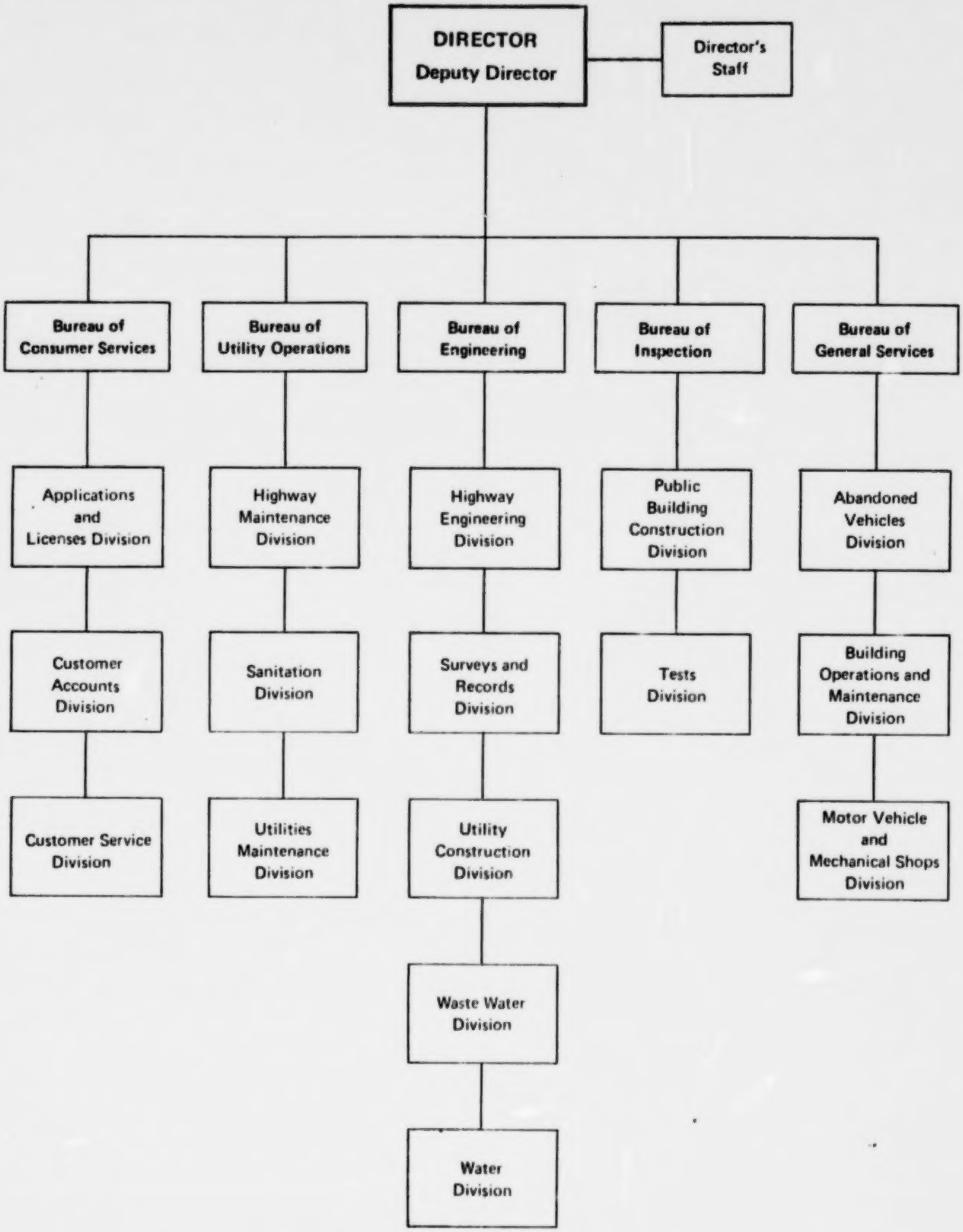
DIRECTOR
Deputy Director
Director's Staff
Bureau of Consumer Services
Bureau of Utility Operations
Bureau of Engineering
Bureau of Inspection
Bureau of General Services
Applications and Licenses Division
Customer Accounts Division
Customer Service Division
Highway Maintenance Division
Sanitation Division
Utilities Maintenance Division
Highway Engineering Division
Surveys and Records Division
Utility Construction Division
Waste Water Division
Water Division
Public Building Construction Division
Tests Division
Abandoned Vehicles Division
Building Operations and Maintenance Division
Motor Vehicle and Mechanical Shops Division

FIGURE 4: PUBLIC WORKS ORGANIZATION - CITY OF BALTIMORE

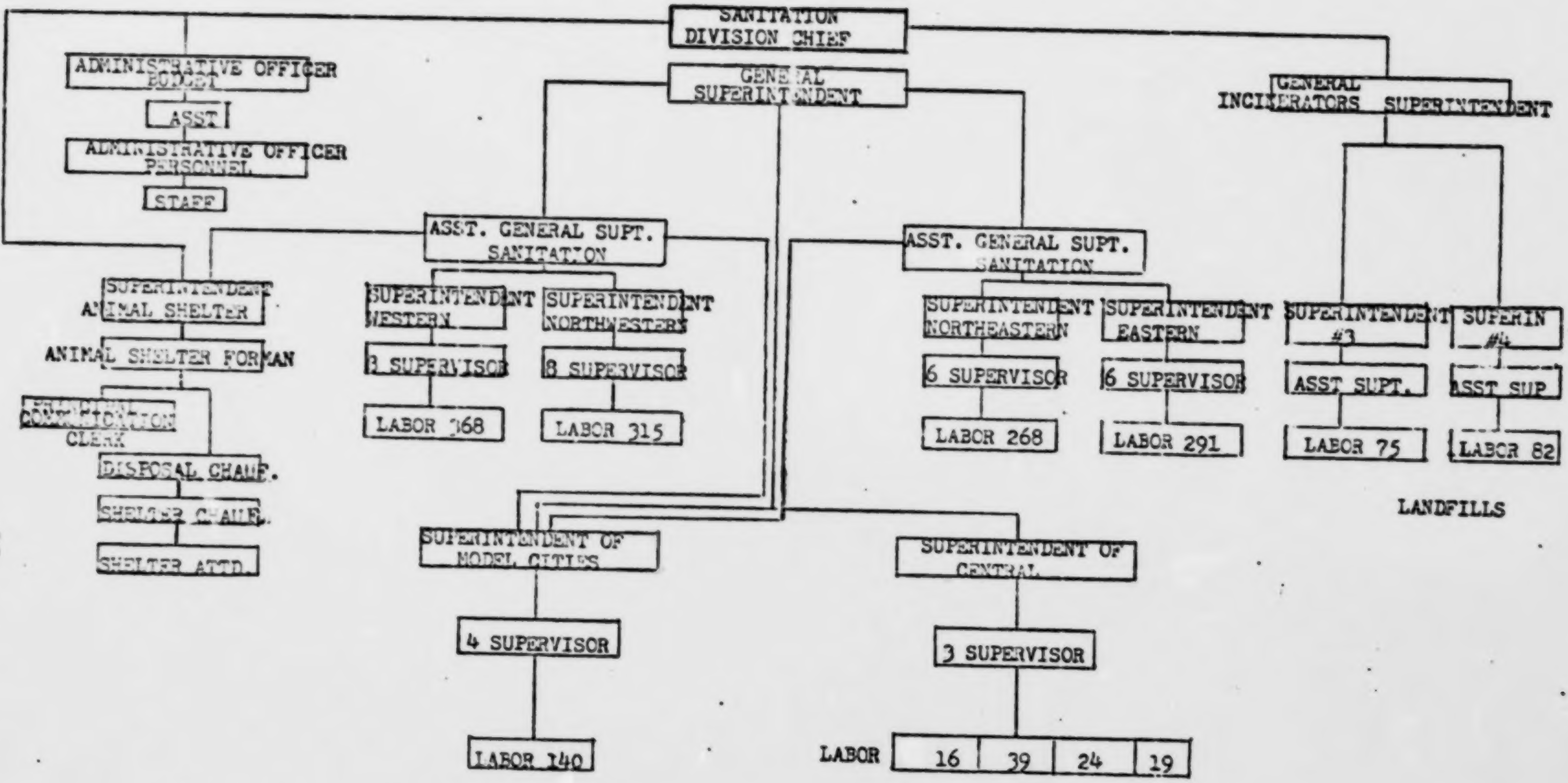
SANITATION DIVISION CHIEF
GENERAL SUPERINTENDENT
ADMINISTRATIVE OFFICER BUDGET
ASST
ADMINISTRATIVE OFFICER PERSONNEL
STAFF
GENERAL INCINERATORS SUPERINTENDENT
ASST. GENERAL SUPT. SANITATION
ASST. GENERAL SUPT. SANITATION
SUPERINTENDENT ANIMAL SHELTER
ANIMAL SHELTER FORMAN
PRINCIPAL COMMUNICATION CLERK
DISPOSAL CHAUF.
SHELTER CHAUF.
SHELTER ATTD.
SUPERINTENDENT WESTERN
8 SUPERVISOR
LABOR 368
SUPERINTENDENT NORTHWESTERN
8 SUPERVISOR
LABOR 315
SUPERINTENDENT NORTHEASTERN
6 SUPERVISOR
LABOR 268
SUPERINTENDENT EASTERN
6 SUPERVISOR
LABOR 291
SUPERINTENDENT #3
ASST SUPT.
LABOR 75
SUPERIN #4
ASST SUP
LABOR 82
LANDFILLS
SUPERINTENDENT OF MODEL CITIES
4 SUPERVISOR
LABOR 140
SUPERINTENDENT OF CENTRAL
3 SUPERVISOR
LABOR
16
39
24
19

FIGURE 5: DIVISION OF SANITATION ORGANIZATION - CITY OF BALTIMORE

the Metropolitan Refuse Disposal Committee (Baltimore City, Baltimore County, and Anne Arundel County) was formed to study area-wide disposal system alternatives. The committee's 1963 report concluded that collection should remain a local function but that cooperation for disposal was required.

Of the three governments, Baltimore City was most in need of additional disposal facilities, and it alone needed cooperation in refuse disposal. Further consideration of jointly operated incinerators based in Baltimore County were made during June of 1965. In 1968, these ideas were still active, and a plan for a Southwest Materials Reduction Center near the Reedbird incinerator was submitted to Baltimore County. It was never built due to political problems. Efforts to rail-haul wastes to Western Maryland and Virginia have been planned but never implemented.

Baltimore is currently planning to upgrade one of its incinerators to meet air pollution requirements. This renovation is to be funded by bonds authorized in a 1971 referendum. Baltimore is also involved in a city/state/federally funded program to build a new $14 million, 1000-ton-per-day pyrolitic incinerator at the old Reedbird incinerator site. Finally, the state and political subdivisions (5 counties and the city) funded a study by a private consulting firm to investigate various disposal alternatives, including rail-haul and recycling options.

4.4: Agencies Impacting Baltimore's Solid Waste Management System

4.4.1: State Level

State Department of Health and Mental Hygiene, Environmental Health Services (EHS), Division of Solid Waste

This Division existed prior to the formation, in 1970, of the Maryland Environmental Service (MES). The Division's role is still significant because the legislation for the MES stipulates a continuing and interdependent relationship between the EHS and the MES. The Division has four sections: Technical Advice and Assistance (TA&A), Monitoring and Surveillance (M&S), Hazardous Wastes and Special Projects, and Planning and Evaluation (P&E).

TA&A helps counties design sanitary landfills. M&S keeps track of waste disposal facilities and makes sure they do not break laws or revert to open dumps. P&E has recently completed a 10-year Comprehensive Solid Waste Plan for the State and is coordinating and supervising the county solid waste plans due by January, 1974. The Division has been found to be lacking in awareness of current technology due to its understaffed condition. The Division has been described as hopelessly undermanned for its responsibilities, as compared to other Divisions concerned with air and water quality. It is the only State agency other than the MES concerned with solid waste management.

State Department of Natural Resources, Including the Department of Water Resources (DWR) and the Maryland Environmental Service (MES)

This Department has two divisions responsible for solid waste activities: the Department of Water Resources (DWR) and the Maryland Environmental Service (MES). The DWR enforces water quality standards with respect to industrial waste discharge. The MES, created in 1970, is to investigate and establish regional facilities and solutions for a variety of environmental areas including solid waste management. The MES is a state corporation formed to provide for the purification and disposal of liquid and solid wastes with a broad set of activities and responsibilities.

The MES has potentially unlimited financial support and will charge fees for its services. It is a State agency which can work on state, regional, and local projects and is eligible for Federal planning, demonstration, and training funds. MES can float bonds for construction of facilities, with its customers paying it back over an established time period.

Baltimore City has received EPA funding for the Monsanto pyrolysis plant; the original proposal to EPA was refused, but a combination of State and local funding resulted in the Federal contribution. The MES is the agency most likely to have a major impact on Baltimore's long-range solution to solid waste management problems.

4.4.2: Regional Level

Baltimore Regional Planning Council (RPG)

The RPC is composed of 22 voting members; 18 are elected officials from Baltimore City and the surrounding five counties (SMSA), and the other four are state representatives. A staff of professional planners is responsible for carrying out the work program for local agencies. The RPC began in 1954 on an *ad hoc* basis and became official in 1963. Other analyses of the RPC indicate that it shows little concern for implementation of its plans. The implication is that the planning being done does not deal with the region's most pressing problems. Its two solid waste efforts are in the development of a solid waste transportation model ($23,930 with $15,953 from the EPA) and a state and locally funded contract for solid waste planning consultant efforts ($96,000). The transportation model deals with collection aspects of solid waste systems.

The State Legislature has required all counties to create comprehensive solid waste plans by 1974. The RPC will do this for its six jurisdictions as a combined effort with the Maryland Environmental Service (MES), which also has a solid waste planning requirement. RPC has hired consultants for this effort. RPC staff feel that solid waste management efforts should be left to the MES.

Metropolitan Area Council (MAC)

The MAC was created in 1965 and is composed of Baltimore's Mayor, the County Executives of Baltimore and Anne Arundel Counties, the President of the Baltimore City Council, and the Chairmen of the County Councils of the two counties. In 1970, the MAC appointed a Water, Sewer, and Solid Waste Committee to develop a program for the needs of Baltimore to the year 2000. The Committee had 15 members and was chaired by Baltimore's Director of Public Works. Its report, submitted in 1971, recommended that the State Legislature create a Greater Baltimore Metropolitan Sanitary Authority to include all the counties in the SMSA and Baltimore. The report is still with the State Legislative Council for revision and correction of legal technicalities. The implication of the report is that the city and county officials have a preliminary commitment to work towards a regional solution of environmental problems.

4.4.3: Local Level

Baltimore City Department of Planning

This Department, responsible to the Planning Commission (see City Organization Chart), has no activities concerned directly with solid waste management. Solid waste plans devised elsewhere are rarely reviewed here unless they conflict with other plans. The Commission, however, can and has refused to approve proposed landfill sites. As a result, local solid waste planning has fallen to the Department of Public Works. City planners tend to feel that eventually solutions for solid waste problems will be regional in nature and are thus the responsibility of the MES and the RPC.

Baltimore Department of Public Works (DPW)

Reorganized in 1968 from ten bureaus to five, the DPW has two internal groups which impact on its Sanitation Division. These are the Technical Services Division (TSD) and the Customer Services Division (CSD). The TSD has the responsibility for investigating technical and technological options for solid waste management, as well as other Department activities. TSD also develops and coordinates the Capital Improvement Program for the Department. The CSD maintains a hot line which connects incoming citizen calls for all Public Works services.

The DPW is intimately aware of its solid waste management problems in terms of increasing wastes generation, the need for final volume reduction, the shifts in population characteristics, and the resultant needs for more services. The DPW has been relatively innovative given the restrictions. New technologies have been investigated and are being implemented. Federal funds have been actively sought. Consultants and the MES have been used. Several city-county arrangements have been attempted. Special services are provided to the Model Cities area, and efforts to computerize data are underway. Within its constraints, the DPW has been creative and supportive in its efforts to improve its solid waste management system.

Baltimore Department of Health

The Sanitary Services Division of the Department of Health impacts the Division of Sanitation in two ways. First, it is responsible for approving solid waste storage containers, and enforces the use of approved containers with enforcement officers. Second, it is concerned with the evaluation of pollutants emitted by incinerators. The Department's major impact has been its unwillingness to approve plastic containers for household refuse storage.

AFSCME Local 44

On September 1, 1968, the city offered a 2-1/2 percent pay increase to blue collar workers and a 5 percent hike to other employees. As a result, the blue collar laborers, most of whom are Sanitation Department employees, went on strike for four days to protest this wage policy discrimination. In actuality, the strike was a result of severe inter-union competition and the wage issue was the hair trigger of the fight for representation. As a result of this crises, the City Council passed Ordinance No. 251 on September 6, 1968. This ordinance provided for: the appointment of a Labor Commissioner; the method of designating a collective bargaining organization; the means of resolving impasse situations; and other relevant mechanisms. The blue collar employees also won a 7-1/2 percent pay increase, and subsequent elections in 1968 and 1969 led to recognition of AFSCME, AFL-CIO, Council No. 67 and Local No. 44, as the bargaining agent for blue collar workers in Sanitation as well as other city departments.

Since the city is currently prohibited from entering into legally binding union negotiations, the city has entered into a "Memorandum of Understanding" with the union. This Memorandum has been supplemented each year since 1968 for each set of blue collar workers represented by Local 44.

Since the '68 strike, it is claimed by the union that there has been a 90 percent increase in blue collar wages. Uniforms are now provided to sanitation laborers. The city has picked up a larger portion of the health insurance and pays a hazard premium to certain employees. Multi-step grievance procedures have been set up for each bargaining unit, although they are rarely used in the Sanitation Department as both sides prefer to resolve grievances on an informal basis. There is also a city-wide apprenticeship training program for blue collar workers.

Labor-management relationships have now stabilized. The issue of union organization has been resolved. The fears that the union would run the city have proven false. No further strikes have occurred, and current negotiable issues revolve around safety training programs, equipment maintenance priorities, and union security agreements, which are still prohibited by statute.

Supervisory personnel and white collar workers are represented by the Classified Municipal Employees Association, which won this representation during the 1968 election.

Women's Civic League

The Women's Civic League was founded in 1910 to focus on conditions affecting health and sanitation in Baltimore. From 1911 to 1923, its Refuse Disposal Committee was active in efforts to clean up the city. In 1960, the Department of Sanitation requested the League to act as "watch dog" for the city's environment. League members inspected collection efforts and received and reported complaints. The League also presents awards to outstanding refuse collection and street cleaning crews.

The League currently feels that the city does a good job of providing sanitation services within the framework of inadequate disposal facilities, increasingly negative citizen attitudes toward the responsibility of storage of trash, and budget constraints. The League favors the use of plastic garbage containers.

Private Contractors

The major portion of industrial and commercial wastes are collected by four private firms: Robb Tyler, Modern Trashmoval, Frank Bohager and Sons, and H. C. Robertson. There are also 50 smaller firms in the area. Tyler uses its own landfills and the county landfill. Trashmoval uses Tyler's fills and some others. Bohager uses commercial landfills and Baltimore's incinerators. Private firms also collect most of the hazardous and toxic liquid wastes, at least those which are not illegally disposed.

The lack of future landfill sites and the creation of the MES will probably impact the private sector as well as the public. MES may eventually be a competitor to the private sector, or it may be in a cooperative role, depending upon the private sector's inclinations to focus on collection only or on collection and disposal functions.

5

SOLID WASTE SYSTEM CHARACTERISTICS

The solid waste system that operates in Baltimore is somewhat different than those that have been studied in other cities. The level of service provided is very high and the collection/sweeping operations are multifunctional. Even at the costs associated with high levels of service, the city's appearance with respect to solid waste is not exceptional.

This chapter describes aspects of the customers, the collection system, and the disposal operations within the city of Baltimore. The collection function and the customer sector are treated in detail because this interface is the heart of all solid waste management systems. Additionally, because Baltimore has a recognized Inner City problem, a separate section is provided to discuss this issue. Similarly, the city has a long history of disposal site procurement problems and a section has been set aside to discuss this activity. The chapter concludes with sections dealing with equipment policies and data, system financing, and different views of the system. In the latter section, the problems and issues confronting the Baltimore solid waste management system are presented from different perspectives, both internal and external to the city government.

5.1: Collection Services of the Sanitation Division

Solid wastes are removed from the streets and residential areas of the city by the Sanitation Division through the operation of six different collection functions - mixed refuse, gang cleaning, beat patrol, bulky articles, ashes, and market refuse. Also, the Division is responsible for the collection of all refuse from closed corner litter containers and open wire litter baskets maintained by the city and strategically located in business and commercial areas, at all street corners where M.T.A. buslines intersect, schools, etc. In addition, the Division is responsible for a portion (about 20%) of the city's snow and ice removal. The major responsibility for this task lies with the Highway Maintenance Division. The Sanitation Division currently contracts for the removal of waste oils and greases.

5.1.1: Mixed Refuse Collection

A principal activity of the Sanitation Division is mixed refuse collection, with more than 80 cents out of every dollar from the General Fund which is allocated to collection services going to this effort.

Description of Duties and Level of Service

The responsibilities and duties of mixed refuse collection employees are stipulated in Section 3, Article 23 of the Baltimore City Code (see Appendix A). The Sanitation Division must collect all mixed refuse not to exceed four twenty-gallon containers and all straight garbage in separate containers not larger than ten-gallon capacity from each residential unit. The Division is restricted by law from collecting mixed refuse from commercial establishments, and it will not accept demolition materials of any kind because they cannot be burned in the city-owned incinerators. Proper containers for both mixed refuse and garbage are specified by City Ordinance and have been in effect since 1948:

> "Receptacles must be of metal or other durable material not affected by weather conditions, with handles and close-fitting covers. A capacity of not less than three and not more than ten gallons is specified for garbage only, and not more than twenty gallons for mixed refuse."

City law restricts the use of heavy plastic containers as a result of a ruling by the Health Commissioner that such material was unable to prevent rats from gnawing through them. Baltimore has a pervasive rat problem which has spread from the harbor area to every section of the city during the past fifteen years. However, debate continues over the merits of the plastic container; and, at the present time, a law suit has been filed by a city resident in an attempt to have the ban against plastic containers lifted.

In 1971, approximately 65 percent of all mixed refuse collection was made in alleys and 35 percent at curbsides. There is some carry-out service performed in the Roland Park section of Baltimore. No special services are offered by the Sanitation Division in its mixed refuse collection function, and no direct user charges are assessed.

Frequency of Collection and Manpower/Equipment Allocations

Mixed refuse collection crews consist of a truck driver foreman (who also collects) and two or three collectors. The equipment for this function consists primarily of 13 and 20 cubic yard rear-loading packer trucks supplemented by several front-end-loading packers. The front-end loading packers, and some of the rear-loading packers equipped with overhead hoisting units are used at housing projects, markets, and public buildings where bulk bins have been installed.

Because of the narrow-alleys and secondary streets in Baltimore, several of the loadpackers have been custom-built (made narrower and, in some cases, shorter) in order to access the backyards through alleys in residential areas. The Sanitation Division first used the low-loading rear packer trucks in 1948.

Baltimore has a slightly unusual mixed refuse collection procedure. The Division operates this collection function six days a week. On Mondays, Tuesdays, and Wednesdays (the heaviest collection days), the truck driver foreman is assisted by three laborers. On Thursdays, Fridays, and Saturdays, only two laborers work with the truck driver.

There are currently 92 [1] mixed refuse collection routes in Baltimore (down from 105 routes two years ago.) The Sanitation Division has divided the city into five operating districts - Northeast, West, East, Northwest, and Central. Within districts there are boroughs, and approximately 9 collection crews are assigned to each borough receiving service. The equipment and manpower allocations for 1971 are shown in Table 3.

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[1] Cut back to 90 crews in early 1973.

Because collection must be made on scheduled days and trucks must have full crews, it is frequently necessary for the Sanitation Division to transfer employees from other collection functions (usually beat patrol or gang cleaning) in order to replace mixed refuse personnel who are sick, absent, or temporarily disabled. As a result, the Division has had difficulty in adhering to its planned schedules for other collection/cleaning functions.

Schedules

Mixed refuse is collected twice weekly, except on legal holidays, according to the following schedule:

1. Monday and Thursday
2. Tuesday and Friday
3. Wednesday and Saturday

No collections are made on the following 10 holidays:

- New Year's Day
- Lincoln's Brithday
- Washington's Brithday
- Good Friday
- Memorial Day
- Independence Day
- Labor Day
- Columbus Day
- Thanksgiving Day
- Christmas Day

TABLE 3

SOLID WASTE SYSTEM
MANPOWER AND EQUIPMENT ALLOCATIONS BY FUNCTION AND DISTRICT, 1971

Function	Mixed Refuse		Gang Cleaning				Beat Patrol					Bulk		Ash		Markets			Corner Cans		Repair Shop				Total
Labor Classification / District	FLC	LLP	LGL	LAC	LAB	MSO	FLC	LAB	Hokey	SAF	LGL	FLC	LAB	FLC	LAB	FLC	LAC	LAB	FLC	LLP	FLC	LAC	LAB	Watch-men	
Northeast	24	66	14	20	75	0	3	6	23	0	0	3	6	0	6	0	0	0	0	0	0	0	0	0	256
West	32	85	14	23	90	0	4	8	46	0	0	3	6	4	12	0	0	3	0	0	0	0	0	0	330
East	25	67	13	19	71	0	3	6	39	0	0	2	4	0	6	1	1	6	0	0	0	0	0	0	263
Northwest	30	81	20	25	83	0	3	6	47	0	0	3	6	2	9	0	0	0	0	0	0	0	0	0	315
Central	1	3	2	1	16	29	0	1	19	2	1	0	0	0	0	1	0	2	1	2	1	2	7	3	91
TOTAL	112	302	63	88	335	29	13	27	174	2	1	11	22	6	33	2	1	11	1	2	1	2	7	3	1,258
Equipment																									
Loadpackers	90															2			1						93
E-Z Packers	2																								2
Large Open Dump Trucks			63				11					11		6											91
Mechanical Sweepers			25																						25
Panel Truck							1														1				2
Hokey Carts							174																		174
Mechanical Flushers			11																						11
Vacuum Leaf Loaders			24																						24
Hired Trucks			4																						4
Pick-Up Truck																					1				1
TOTAL	92		127				186					11		6		2			1		2				427

FLC: Laborer-Chauffeur Foreman
LLP: Laborer Loadpacker
LGL: Laborer Gang Leader
LAC: Laborer Assistant Chauffeur
LAB: Laborer

MSO: Mechanical Sweeper Operator
Hokey: Hokey Cart Operator
SAF: Assistant Foreman

Although the "official" workday is eight hours, from 7:00 to 3:30 with one-half hour for lunch, the mixed refuse collection crews operate on a task incentive system. Division management believe this incentive is a necessary policy, given the wage scales and the cost of living. Consequently, many crews begin their workday at 5:00 a.m. and finish before 1:00 p.m. For some, the early start enables them to hold a second job. According to management, moonlighting is prevalent among laborers. The impact of this policy on absenteeism, turnover, and injuries is not clear.

Community Characteristics

Baltimore is a city of row houses. These single-family, attached residential units (called by the recently popularized euphemism "townhouses") represent 49 percent of all year-round housing units in the city according to the 1970 Census of Housing (Table 4).

TABLE 4

BALTIMORE CITY CENSUS OF HOUSING, 1970

All year-round housing units	305,109
Units in Structure:	
1, detached	36,959
1, attached (row house)	149,973
2	37,436
3 and 4	26,366
5 or more	54,199
Mobile home or trailer	176

The vacancy rate for Baltimore is relatively high at 9,712 units or 3.2 percent. The Sanitation Division claims that it collects from 100,000 residential units per day; or, operating three different schedules, the Division reports that its crews remove mixed refuse from a total of 300,000 different housing units twice per week. It is obvious from the above data that this figure may be high. Taking into consideration vacancy and apartment dwelling units not served by the Division, a more reasonable estimate would be about 230,000 units or 77,000 "stops" per day. All efficiency and productivity calculations are based on the reported figure of 300,000 units; however, it is necessary to point out that 300,000 is probably an upper limit.

According to management, the biggest single problem facing the Sanitation Division within the City is the overall "carelessness of the people." In recent years there has been a marked trend toward less mixed refuse being placed in containers and more in streets and alleys. Management estimates that approximately 30 percent of the population (mostly in the inner-city) do not use containers. Consequently, the Sanitation Division has been forced to increase its street cleaning budget in order to operate more open trucks for the collection of street and alley wastes. This phenomenon is reflected in the fact that although residential solid waste generation in Baltimore is increasing, the mixed refuse collection budget has been cut significantly in recent years.

Recent Developments

Although no major changes in this function are planned, the Sanitation Division is seriously considering the construction of a transfer station in the Northwest district in order to reduce the time and cut the inefficiency resulting from the 2 to 4 trips that loadpacker trucks make to the #4 incinerator and the far-eastern part of the city.

5.1.2: Gang Cleaning

Gang cleaning comprises the largest portion of the Sanitation Division's street cleaning effort. As mentioned in Section 1.1, gang cleaning is becoming an ever more important function as the percentage of solid waste found in streets, alleys, and open lots continues to grow. More dollars are now committed to gang cleaning than to mixed refuse collection in Baltimore.

The Sanitation Division is responsible for cleaning over 2000 miles of streets and 500 miles of alleys in the City. This task is performed by two collection functions -- beat patrol (staffed primarily by push cart operators) and gang cleaning. Gang cleaning crews (consisting of a labor gang leader, a truck driver, and two or three laborers) travel scheduled routes and are responsible for the removal of all wastes found in vacant lots, alleys, and on right-of-ways. The mechanical sweepers are also assigned to the gang cleaning operation and have specific routes to service.

In addition to the sweepers, mechanical-flushing and leaf-loading operations come under the jurisdiction of the gang cleaning function. The mechanical-flushing operation primarily serves the six markets operated by the City as well as the streets in the central business district and other primary streets. Leaf-loading begins soon after Labor Day and continues until all leaves are collected, usually by Thanksgiving.

As mentioned before, gang cleaning personnel are sometimes called upon to serve as mixed refuse collectors. Because of the random nature of this employee transfer between the gang cleaning and mixed refuse collection functions, the Sanitation Division has frequently been unable to maintain its schedule in the street cleaning operation. This problem has become even more acute as both absenteeism and the demands for street cleaning have increased.

One additional complicating factor is that during snow storms, gang cleaning crews are called upon not only to "double" as mixed refuse collectors but also to serve as snow removal teams. Of course, with snow on the ground, street cleaning is impossible. Therefore, it is logical to use these men to remove the snow first.

As in mixed refuse collection, no special services are offered by the gang cleaning crews.

Frequency of Collection and Manpower/Equipment Allocations

Gang cleaning crews consist of 4 or 5 men and collect wastes from the city's streets which are placed in large open dump trucks, either 5 or 8 cubic yard capacity. The equipment available to the crews are shovels, push brooms, plastic garbage bags, and related items. The working crews operate daily except Sundays. In residential areas, gang crews operate five days a week, Monday through Friday. Residential streets are "theoretically" patrolled twice weekly and alleys at least once weekly; but this level of service very frequently is not achieved.

Residential areas farther away from the central business area (known as the "residential annex") are supposed to have their street and alley wastes collected by the gang cleaning crews twice a month. Because these areas are relatively cleaner than the inner-city, they have the lowest priority. Consequently, when there are budget cuts or personnel transfers to mixed refuse collection, the first gang cleaning crews pulled are those assigned to the annex areas. Interestingly, this practice meets with little citizen complaint. Pride motivates these residents to personally see to the cleaning of their streets and alleys. As a matter of fact, there is a section of eastern Baltimore (Highlandtown) where the residents will not allow gang cleaning crews or beat patrols to operate because their service does not meet the residents' standards for street and alley cleanliness.

Another section of the City (the Roland Park area) is not served by the Sanitation Division. This upper-income neighborhood is served by a private firm, the Roland Park Company, which is under contract to the City to perform street cleaning operations.

Table 3 details the manpower/equipment allocations made by the Sanitation Division for the gang cleaning function.

Community Characteristics

Several factors complicate street cleaning operations in Baltimore. First, the City is old and streets are relatively narrow. Second, the metropolitan area is highly industrialized and soot presents a significant street cleaning problem. (Bethlehem Steel has a major sheet metal and shipbuilding facility just outside the City limits at Sparrows Point.) Third, the high percentage of row houses results in high density on-street parking. And finally, Baltimore has undertaken a major urban renewal effort; and, consequently, streets (particularly in the inner-city and central business district) are constantly being repaired. Otherwise, the terrain and climate present no unusual problems to gang cleaning crews.

5.1.3: Beat Patrols

The balance of the Sanitation Division's street cleaning effort is the beat patrol. Staffed primarily by Hokey (push) cart operators, the beat patrol deposits street and alley wastes at specified collection points where it is picked up by truck crews assigned to this duty.

Description of Duties and Level of Service

In the central business area, the beat patrol operation is handled by the Hokey cart operators who follow established routes continuously throughout the day, 5 days a week. In the residential areas, Hokey cart operators are responsible for sweeping alleys and gutters and are assisted by truck crews. Not all residential areas receive beat patrol service, particularly the residential annex areas. Those residential areas which do have beat patrols are supposed to be visited by the Hokeys and truck crews on the same schedule as the gang cleaning operation. The beat patrol offers no special services to city residents or business establishments and makes no special user charges.

Frequency of Collection and Manpower/Equipment Allocations

Collection of street litter and other wastes by Hokey cart operators is continuous; in many cases, a route is traversed many times a day in the downtown areas. While residential areas are patrolled less frequently, the service is more dependable than that offered by the gang cleaning crews since the beat patrol is not called upon as often to substitute for mixed refuse collectors.

The equipment used by the Hokeys consists of a cart which is nothing more than a large trash can on wheels, a shovel, a push broom, a dustpan, and a "paper picker" (a stick with a nail at one end). The beat patrol crews working with the Hokey cart operators consist of a laborer-chauffeur foreman and two laborers. Hokeys remove litter from the sidewalks and curbs and place collected wastes in their carts which are lined with plastic bags. Once filled, these bags are left by hokeys at street corners and are collected by the beat patrol crews as they canvas their assigned area of the city in the dump trucks. Their equipment includes a large open dump truck (5 or 8 cubic yards), shovels, brooms, and plastic trash bags. Detailed manpower/equipment allocations are shown in Table 3.

The trucks also serve to transport Hokeys and their carts from district headquarters to the areas which they patrol. There are approximately 15 pushcarts to each dump truck.

5.1.4: Bulky Articles

Bulky article collection is the only service performed on request only and provides for the removal of all residential wastes too large to be handled by mixed refuse crews.

Description of Duties and Level of Service

Apparently, no limitation is placed on the size or weight of items collected. The Sanitation Division is required to remove all bulky items upon request up to a limit of three items per household per call. This restriction is seldom enforced because if articles are put out by the residents, the crews will generally collect all of them.

Bulky items are taken to one of the landfill sites operated by the city for disposal. No special charge is made for this service.

Frequency of Collection and Manpower/Equipment Allocations

Bulky article collection routes are scheduled so that the crews are available to remove items from each residential unit requesting service twice a month. The crews work an eight-hour day, Monday through Friday. The manpower/equipment allocations are quite simple, consisting of one driver and two assistants on each liftgate truck. Table 3 summarizes the information obtained from the Sanitation Division.

5.1.5: Ash Collection

Ash collection is very similar to the combined waste collection operation except, of course, that the wastes removed by the ash collection crews are the non-combustible residues from the furnaces in apartments, tenements, and private dwellings.

Description of Duties and Level of Service

City ordinance requires that the Sanitation Division collect up to sixteen ten-gallon containers from each housing unit per week. No more than eight ten-gallon containers will be collected on any pick-up unless the immediately preceding scheduled collection day was a holiday, in which case sixteen containers will be taken. By law, the containers must be made of metal or other durable metals and have close-fitting covers and handles. In addition, ash containers must be at least three but no more than ten gallons in capacity. Here too, no special service is offered by the Division.

Frequency of Collection and Manpower/Equipment Allocations

During the "winter" months (mid-October to mid-April), collections are made twice a week on schedules similar to those worked by mixed refuse crews. During the remainder of the year, collections are made once a week. Although similar to combined waste collection, ash collection is more labor-intensive. This is due in part to the relatively small size of the collection receptacles and the increased number of receptacles which must be collected. Once again, the reader is referred to Table 3 for details on the number of men and equipment assigned to this function.

5.1.6: Market Collection

The city operates six markets, and there is one which is privately owned - the Lexington market. Mixed refuse collection of all seven markets and the sweeping and washing of the city-owned markets is the responsibility of the Sanitation Division.

Description of Duties and Level of Service

All city-owned markets are washed on market days, Saturday nights, and the evening before a holiday when weather permits. All city-owned markets are cleaned daily except Monday. One exception is the Fish Market, which is cleaned every day. Mixed refuse collection is facilitated through the use of dumpsters at all markets and collection is made daily.

Manpower/Equipment Allocations

Market refuse collection represents the smallest function operated by the Sanitation Division. Two loadpacker trucks and crews are used to collect garbage wastes from individual booth operators. All other mixed refuse is collected by the division's two front-end loaders. Table 3 details this function's manpower and equipment level.

5.1.7: Other Collection Functions

In addition to the above, the Sanitation Division is responsible for several other collection operations. Of these, two most important are the collection of stray dogs and dead animals, and the removal of waste oils and greases.

Animals

Almost 20,000 stray dogs and 30,000 dead animals are collected by the Division each year from the streets of Baltimore. Stray, 10-day-bite, unwanted, sick and injured dogs are kept at the Municipal Animal Shelter. Collection of both live and dead animals are made with five specially designed vehicles and two-man crews. In addition, there is an emergency truck with one driver/collector that operates 24 hours a day, seven days a week.

Waste Oils and Greases

The Sanitation Division does not collect the waste oils and greases from filling stations andother commercial establishments in Baltimore; however, the Division is responsible for the supervision of the removal of these liquid wastes. Up to the present time, the Division has been able to obtain the services of a private contractor for collection. The Chief of the Sanitation Division expressed some concern during the interview that he might not be able to obtain this service in the future. Last year, there was only one bid submitted for this operation.

5.2: Solid Waste System Productivity and Quality of Service

Most of the data presented in this section appear in the published reports of the Sanitation Division on the Department of Public Works. Unfortunately, the Sanitation Division is currently in the process of preparing its 1972 Annual Report; and, consequently, the most recent collection data for 1971-1972 was not made available to our investigating team since the data were still being tabulated.

5.2.1: Productivity of Collection

For clarity and comparative purposes, productivity and efficiency data for the collection functions performed by Baltimore's Sanitation Division are presented in Table 5.

Mixed Refuse Collection

Several items stand out in the data for Baltimore's mixed refuse collection function. First of all, the annual per capita cost ($5.00) and the annual cost per residential unit ($15.25) are relatively low for an old, large, industrial city, even though per capita solid waste generation in Baltimore is about average at 2.4 pounds per day. The cost per ton collected is also very low at $11.36.

Baltimore's Sanitation Division has achieved remarkably high productivity from its collection crews: The average crew is reported to make 1100 stops per day, and the daily collection rate is approximately 4.2 tons per man or 14.4 tons per truck.

Management estimates that mixed refuse from residential units in Baltimore consists of approximately 90 percent trash and 10 percent garbage. The total amount of mixed refuse collected in FY 1970-1971 from residential units was just over 400,000 tons or 888 pounds per citizen per year. A yearly total of 400,000 tons of mixed refuse is equivalent to just under 35 pounds per stop, onthe average (Table 6). Collections during the months of June, July, August, and December are the heaviest, approximately 10 percent above the monthly average calculated from the total annual tonnage collected.

TABLE 5

EFFICIENCY/PRODUCTIVITY DATA FOR BALTIMORE'S SOLID WASTE SYSTEM

	Parameter \ Collection Function	Mixed Refuse	Gang Cleaning	Beat Patrol	Bulky	Ash	Markets
Community Description	Population Served	915,000					
	No. of Resid. or Comm. Units	300,000					6
	Street Miles	2,000					
	Alley Miles	500					
	Area (sq. mi.)	78.3					
	Pop. density (peo/sq.mi.)	11,700					
Waste Amounts	Annual Amounts Collected	402,299 tons	336,498 cubic yards		63,978 cu. yd.	26,329 cu. yd.	8,541 tons
	Lbs./unit/wk	51.0	—		—	—	—
	Lbs./person/day	2.4	—		—	—	—
Collection System Description (inc. Level of Service)	Point of Collection	Alley - 65% Curbside - 35%	Streets, gutters, and alleys		Alley and curbside		Containers and market stalls
	Freq. of Collection	2/week	—		2/month	Winter - 2/wk. Summer - 1/wk.	1/week
	Type of Storage Container	10 and 20 gallon metal cans	—		—	3 to 10 gallon metal cans	20 gallon metal and bulk bins
	Ave. Dist. to Disp. Site	5 miles					
	Avg. Miles Driven/truck/day	35 miles					
	Avg. Hours worked/day	7	8				
	Direct men	414	515	217	33	39	14
	Crews	92[1]	88	184	11	6	—
	Crew Size	M-W:4 T-S:3	4 or 5	3 or 1[2]	3	4	—
	Trucks	92	65	12	11	6	2
Wages	Ave. wages and fringe for laborers	$3.29	$3.14				
	Ave. wages and fringe for drivers	$3.53	$3.25 — $3.87	$3.53			$3.25 — $3.53
Collection Cost/Efficiency Figs.	Stops/Crew/Day	1100	—		—	—	—
	Tons/Crew/Day	14.6	11.6 - 13.7		22.4	14.6	14.3
	Coll. Cost/resid. unit/yr.	$15.25	$20.03		$1.08	$ .86	$ .72
	Coll. Cost/person/yr.	$ 5.00	$ 6.57		$ .35	$ .28	$ .24
	Coll. Cost/ton/yr.	$11.36	$17.86/yard		$5.00/yd.	$9.78/yd.	$25.35
	Total Coll. Cost/yr.	$4,571,687	$6,009,071		$320,559	$257,556	$216,504
Disposal	Type & No. of Disp. Sites	Two Incinerators and Three Landfills					
	Total Disp. Cost/yr.	$2,323,383					
Total Cost	Total Cost/yr.	$13,698,760					
Misc. Cost Ratios	Coll. Expense as % of tot. Exp.	83%					
	Coll. labor expense as % of tot. Coll.	71%					
	Coll. equip. expense as % of tot. Coll.	19%					
	Proc. & Disp. expense as % of tot. exp.	17%					
	Proc. & Disp. labor expense as % of tot. disp.	70%					

[1] Cut back to 90 crews and trucks in early 1973

TABLE 6

AVERAGE MIXED REFUSE COLLECTION PER STOP

Annual residential mixed refuse collection	400,000 tons
Number of occupied residential units served by the Sanitation Division	300,000 units
Number of collection days per year per residential unit	101 days
Average Mixed Refuse per Stop	26.5 lbs

Although the Sanitation Division reported an average of 12 tons of mixed refuse per truck per day, the data suggest that the amount is closer to 14 tons (Table 7).

TABLE 7

AVERAGE DAILY MIXED REFUSE COLLECTION PER TRUCK

Daily Residential Mixed Refuse Collection	1,320 tons
Number of routes	92 [1/]
Number of trucks per route	1
Average collection per truck per day	14.4 tons

Collecting an average of 14 tons (about 55-65 cubic yards) per day necessitates each truck making 2, 3, and in some cases 4 trips to the incinerator. While the truck makes the round trip to the incinerator (which usually takes one-half hour to 45 minutes), the laborers use the time to eat lunch or to move containers from backyards into the alleys in advance of the truck. This set-out procedure significantly increases the speed of collection, which is a benefit to both residents and collection crews.

Although management claims to employ routing procedures "developed" through years of experience," questioning revealed that, in reality, very little is done except to monitor the "return" times of the crews in the afternoon. This approach may act as a negative incentive, for if a crew.

[1/] Cut back to 90 crews in early 1973

is efficient and completes the collection route early (say at 1:15 p.m.) then management might reassign it to a longer, more difficult route. However, this problem has never developed to the best of management's knowledge.

Although no data is reported, an estimate of the average route length can be made given the information on miles of streets and alleys and percentages of curb and alley pick-up (Table 8).

TABLE 8

STREET-ALLEY DATA FOR BALTIMORE

Number of miles of streets	2,000
Number of miles of alleys	500
Percentage alley collection	65
Percentage curbside collection	35

Assumptions: (1) Each alley mile corresponds to two street miles

(2) 90% of the alleys can accommodate the collection trucks

(3) 20% of city streets do not border residential units

Number of alley miles served (.9 x 500) = 450 miles

Number of street miles corresponding to the served alleys (2 x 450) = 900 miles

Remaining street miles (2000-900) = 1100 miles

Mileage of these streets with residential units (.8 x 1100) = 880 miles

Total miles collected (450 + 880) = 1330 miles

Number of collection schedules = 3

Miles per collection schedule (1330 ÷ 3) = 445 miles

Number of collection crews = 92

Average distance per collection crew (445 ÷ 92) = 4.8 miles

The Baltimore mixed refuse collection system is, of course, labor intensive with all of the inherent inefficiencies resulting from sickness, absenteeism, disability (genuine and otherwise) and turnover. In 1971, the cost of the mixed refuse collection function was about 4-1/2 million dollars, for which just over 73 percent was labor costs.

Gang Cleaning and Beat Patrol

The street cleaning operation (the gang cleaning and beat patrol functions) presents the greatest costs and, it seems, the greatest inefficiencies in Baltimore's solid waste system. The per capita cost ($6.57) and the annual cost per residential unit ($20.03) are 31 percent higher than mixed refuse costs. This is due primarily to the manpower requirements (742) which are almost 80 percent greater than mixed refuse (414). Man and truck productivities are also lower than those achieved by mixed refuse crews.

On the average, gang cleaning crews remove approximately 23,000 cubic yards of litter and other materials from the streets and alleys of the city each month; and there is very little seasonal variation. The absence of any significant variation is surprising and is probably due to either inaccurate measuring/reporting techniques by the Sanitation Division or a relative constant litter rate in a city of the size of Baltimore.

This monthly estimate of gang cleaning operations is equivalent to 13.7 cubic yards per day per truck and 2.2 cubic yards (approximately 450 pounds) per laborer per day. The volume of street wastes necessitates the average crew making 2 or 3 trips to the disposal site per day.

In 1970, just over 19,000 cubic yards of leaves were collected by the Division, using 24 vacuum-type leafloader trucks. Over a three-month period, this is equivalent to slightly more than 11 cubic yards of leaves per leafloader per day.

Gang cleaning, unlike mechanical street sweeping, mechanical flushing, and leaf-loading where costs are split about evenly between equipment and labor, is very labor-intensive with more than 82 percent of the operating costs tied to labor.

The Sanitation Division reported that Hokey cart operators sweep eight to twelve cans of litter each day depending on the area. It is also reported that the street cleaning operation (gang cleaning and beat patrol) collects almost 340,000 cubic yards of waste. Using the known truck distribution between the gang cleaning and beat patrol operations, a calculation indicates that an average Hokey cart operator picks up about 1 cubic yard of waste per day. This value agrees well with the total number of cans swept up.

The beat patrol, is as might be expected, the most labor-intensive collection function. Almost 85 percent of its operating costs are direct labor expenses.

Bulky Articles, Ash, and Markets

Very little may be said concerning the remaining three functions (bulky articles, ash, and markets) except to point out that these operations represent only a small portion of the Sanitation Division's annual budget ($795,000 or 7 percent) and manpower requirements (86 or 6.9 percent).

Bulky trash collection crews picked up almost 64,000 cubic yards of waste material in FY 1970-1971 which necessitated, on the average, almost four trips per day to the disposal sites by the collection trucks.

Over 26,000 cubic yards of ashes were collected by the Sanitation Division during FY 1970-1971. Of course, ash volumes exhibit seasonal fluctuations, reaching 1100 cubic yards per week in December-January and about 175 cubic yards per week in mid-summer. Winter peaks necessitates four to six trips per day to the disposal site by the collection crews. During the summer, only one disposal trip is required.

5.2.2: Quality of Service

In addition to the relatively high level of service offered to the citizens in Baltimore, the quality of service appears to be excellent. Table 9 presents annual "requests for services" data for the last four years. Only the columns entitled Missed Collections, Dirty Streets, and

Dirty Alleys can be taken as complaints because the remaining columns are really requests for additional service.

In view of the street and alley cleaning activities in the city, it is no surprise that complaints about these functions are few and relatively constant over time. Missed collection complaints have been on the rise, but the number of calls received in 1971-1972 (13,000) represent only .042 percent of the total number of services performed that year. This is exceptionally low.

TABLE 9

HISTORY OF "REQUESTS FOR SERVICES"

YEAR	TOTAL NO. OF REQUESTS	MISSED COLLECTIONS	BULK REFUSE	DIRTY STREETS	DIRTY ALLEYS	ASHES, BRUSH ETC.	ANIMALS
1971-72	137,464	12,976	88,297	4,449	6,097	19,831	5,794
1970-71	128,369	11,108	74,003	5,029	5,744	20,210	12,275
1969-70	104,589	7,056	61,343	5,377	6,283	16,374	8,156
1968-69	87,371			5,431	6,713	65,777*	9,450

* INCLUDES MIXED REFUSE, BULK, AND MISSED COLLECTIONS

5.3: Turnover and Absenteeism

The City of Baltimore does not keep any tabular data regarding Turnover and Absenteeism.[1] The city does regard these problems as significant; but apparently it has been decided that under the current constraints, any corrective measures would be too difficult to implement.

During the course of the interviews, it was stated that Turnover is now employee-initiated in most cases. There is a policy of attrition that is being practiced to reduce unnecessary staff. For the month of September, the following employment figures for skilled and unskilled workers were provided:

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[1] The solid waste system management initiated a data keeping effort for absenteeism shortly after the city was visited. Records now extend back to and include September 1972.

- Employment at beginning of month: 1174
- Employment at end of month : 1152
- Number of terminations : 26
- Number of entries : 4

If September is assumed to be a normal month, then Turnover is quite low at about 27 percent. Unfortunately, there is no other data to compare with this value.

Absenteeism was also stated as severe in the sanitation work force. Recent data indicates that an average of 12.5 percent of the scheduled work force is either absent without leave or sick on any given workday. The fraction of this value which is attributed to sickness is normally significantly smaller than that for unexcused absences. The absenteeism rate is particularly acute on Saturdays and Mondays which is an observation not unique to solid waste management systems. The Director of the Sanitation Division would like to find a solution to this problem inasmuch as it is costly to the city.

5.4: Inner City

The Baltimore inner city area does not receive special treatment from the Division of Sanitation directly. This area is, however, provided with increased sanitation services through the local Model Cities Program. This program, financed through the Department of Housing and Urban Development, has greatly increased the solid waste collection activities in this area. A full discussion of the program, its cost, and routing structure is presented in Appendix B. Highlights of the major aspects of the program are presented below.

The sanitation program was designed to serve three interrelated problems within the Model Cities community. First, the program was intended to increase the sanitation services available to the area. This was accomplished by providing the following aid to the community:

A. Handsweeping and cleaning three times per week of all street gutters, sidewalks, and all public and private alleys;

B. Collection once per week on a regularly scheduled day of all bulky items of trash set out for removal without need for special request to the Sanitation Division (usually made by phone calls);

C. Cleaning as needed of all vacant lots, many of which are City owned;

D. Mechanical flushing once per week of all streets;

E. Emptying four times per week of all corner trash receptacles (i. e., wire baskets).

The Model Cities Program operates 31 pieces of equipment to complete these duties. This includes thirteen large open dump trucks, two flushers, four liftgate trucks, five cars, and two sweepers. This equipment was purchased independent of the Division of Sanitation but is maintained by the Motor Vehicle and Mechanical Shops. The Model Cities Program pay the shops for this service similar to the arrangement with the Division of Sanitation. It is interesting to note that, unlike the Division of Sanitation which depreciates its equipment and establishes a sinking fund for purchasing new equipment, the Model Cities Program does neither. The reason for this is that the Model Cities Program has a limited life of only five years. Thus, the equipment will be used and, as the program currently stands, not replaced.

The second problem was the large amount of unemployment which existed in the Model Cities area. When the program was initiated in 1970, the unemployment rate in this area was 13 percent. To combat this problem, the sanitation program required that all workers be residents within the Model Cities community. If sufficient manpower or adequately trained personnel could not be obtained within the area, then the program would allow workers from other areas to be employed. This segment of the program has been very successful as 200 men are now currently employed. This figure is even more striking when the socio-economic characteristics of these workers are examined. The median educational level of a worker is only the ninth grade, with only about 20 percent of the employees completing high school. Previous to their employment in the program, the median length of unemployment for these workers was one year. The significance of this figure increases greatly when one considers that 80 percent of the employees have one or more dependents to support.

While the program has been measurably effective by cleaning up the area and increasing employment, it has had limited success to date in tackling the third problem of educating many of the model neighborhood residents to the importance of proper sanitation techniques. The program has attempted to educate the residents, but the citizens have generally been unresponsive. This problem is especially of concern, because the cleaning and employment programs can achieve only limited success without an enlightened and educated group of residents. When the model cities project is over, the first two programs are over and it is the third program that will continue in effect.

One way in which the program could possibly improve the appearance of the area would be by giving, or selling at cost, waste containers to the residents. As was pointed out earlier, a basic problem within the city is the lack of waste containers for the storage of mixed refuse. This program would cut down on vagrant refuse and perhaps help eliminate the rodent problem in the area. While Model Cities officials have contemplated action of this type, they have been extremely slow in implementation.

5.5: Disposal Methods - Present and Planned

As discussed briefly in other sections, the disposal of Baltimore's solid waste has been and is now a significant problem. This problem results from the dwindling areas available for sanitary landfill, the impact of water and air quality laws, and the inability of the city to procure suitable landfill sites beyond the corporate boundaries.

There are now five sites being used for municipal solid waste disposal. Two are incinerators, each designed for 700 tons per day and the remaining are landfill sites with rapidly approaching lifetime limits. Although the aggregate incinerator capacity is 1400 tons per day, the older incinerator has been on line for forty years and is being operated at half its rated design. The heat content of the waste has risen significantly since it was built. The other incinerator, which is 16 years old, is being run at its design limit.

Air quality legislation has forced the city to schedule the refitting of the newer machine with gas cleaning equipment to meet the standards in 1975. The older installation will be shut down in the same year because of its design limitations and the high cost of modifying it to meet projected pollution laws.

To satisfy the current and forecast disposal demands of the city, the Department of Public Works submitted a 10 year plan to the Mayor's office in April of 1972. This document proposed a sequential order of events to be followed to assure disposal capabilities while complying with environmental legislation. Figure 6 is a Gantt chart presenting the proposed schedule.

There are two principal factors in this timeline. The first is the reduction in disposal demand at the newer of the two incinerators to allow for the installation of $8,000,000 of gas cleaning equipment. [1] Landfill sites are planned to absorb the difference. This will continue to May of 1974 when the repair and refit operation is scheduled to be completed. The

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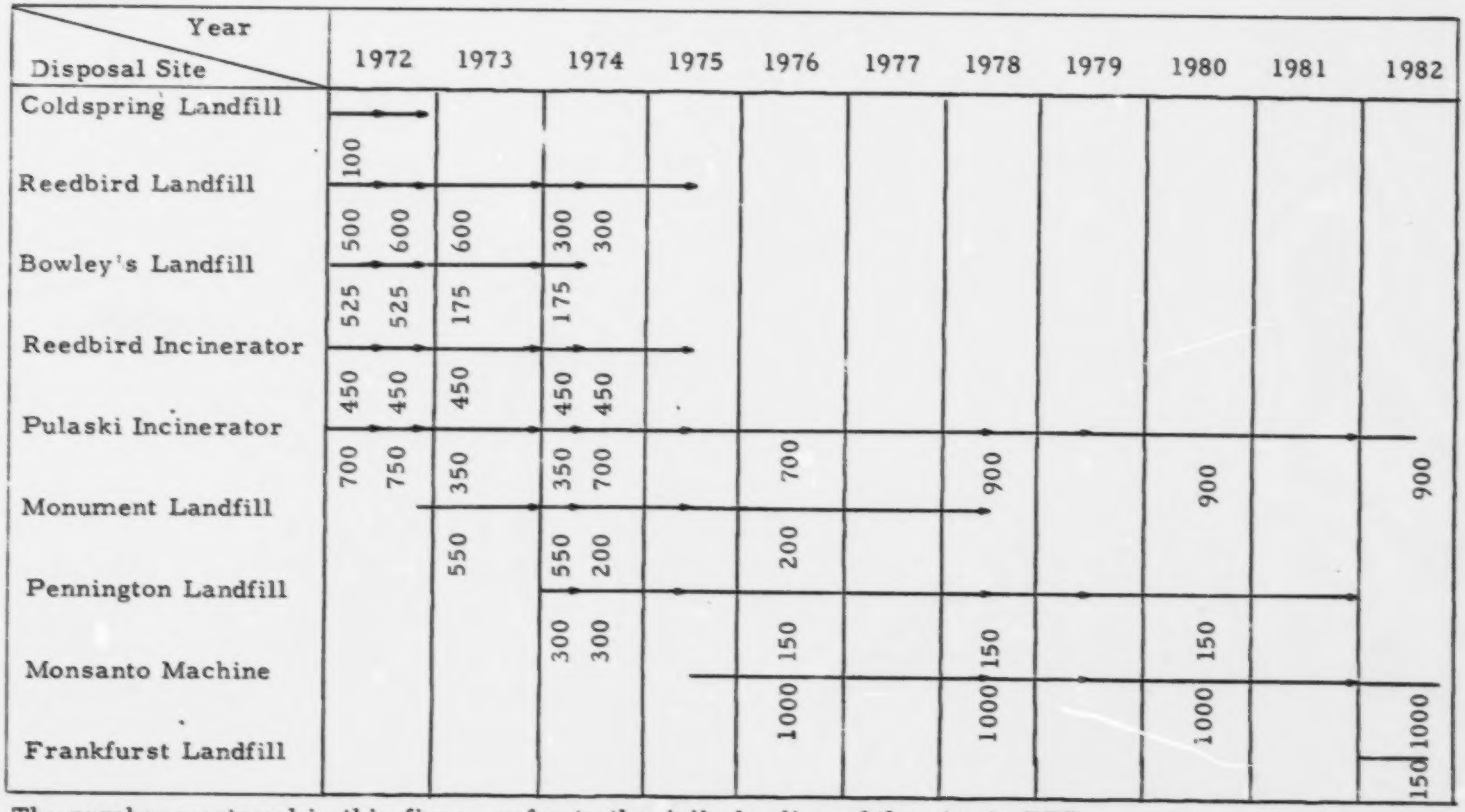
[1] At the time that the case study was performed the cost to upgrade the newer incinerator was $6,000,000. Now, however, two new furnaces and additional electrostatic precipitators have added $2,000,000 to the original estimate.



The numbers entered in this figure refer to the daily loading of the site in TPD.

FIGURE 6: TEN-YEAR DISPOSAL TIMELINE

second is the plan to build a major volume reduction center to come on the line in June of 1975. The form of this method has recently been determined to be a pyrolysis technique which was designed by Monsanto Enviro-Chem Systems, Inc. and is funded by EPA, Maryland, and Baltimore contributions. In addition to offering a disposal site, a byproduct of the process will be the generation of heating steam to be sold to the Baltimore Gas and Electric Company.

The major disposal method projected to be employed at the termination of the 10 year plan is incineration. The probability of occurrance of this event cannot be determined because of the possibility of the implemention of a regional disposal plan. An analysis is being performed by a private consulting firm to explore a variety of approaches, but it is thought that a rail haul operation would be the most feasible long term solution to disposal problems.

Rail haul proposals have not met with much success because of the constraints imposed by local governments regarding the transportation of solid waste across jurisdictional boundaries. For this reason alone, Baltimore officials have regarded rail haul as desirable but improbable. Since the City cannot wait for its neighbors to cooperate, it has chosen to dispose within the city limits. Money has been appropriated, plans for incinerator modifications have been approved, and the pyrolysis disposal unit is now a fiscal reality. The implementation of a rail haul system would force the city to consider the termination of operations at the upgraded incinerator site, which after an expenditure of millions of dollars, would seem to be an improbable choice.

If this choice were to be forced, the answer would hinge on the operating costs of each method and the guarantee for long term use. It has been noted that the current disposal costs to the city are not excessive for incineration and it is clear that rail haul would have to be very competitive. Since there are no figures available for comparison, any conclusions reached at this time would be premature. Similarly, the contractual guarantees for extended disposal arrangements have not been reached.

The most recent operational data from the Division of Sanitation was published for the fiscal year 1970-1971. Table 10 presents the quantity of wastes and their respective disposal costs as a function of source. The incineration costs are reasonable at about $5.00 per ton, but cannot be exactly compared with the cost of landfill operations because wastes going to those sites are measured in cubic yards and tons and does not include incinerator residue. However, these figures can be compared with tonnage values presented in the Solid Waste Master Plan submitted to Mayor Schaefer on April 13, 1972. In this document, it was reported that the two incinerators disposed of an average of 1150 tons per day with an additional 1125 tons per day being landfilled at three sites. The latter figure includes an estimated 450 tons per day of wet incinerator residue.

Subtracting the incinerator residue from the total daily landfill tonnage yields an average of 700 tons per day of waste being landfilled. This value compares reasonably well with the total annual landfill volume (945,513 cu. yards) when computed on a daily basis (3151.7 cu. yards)[1/] and converted to tons (630.3) assuming 400 pounds equals one cubic yard.

On this basis, the unit cost was $.23 per yard, which in terms of tonnage is $1.15 per ton. This is relatively inexpensive as landfill operations go and does not include the wet incinerator ash disposal. Including this additional landfill load, the unit cost drops to $.66 per ton which is a remarkable figure.

The disposal operations currently employ one general superintendent, two superintendents, two supervisors, two weighmasters, six crane loaders, seventy-two skilled furnace operators, and eighty-four laborers. For the latter two categories, 68 are assigned to the older incinerator whereas the remaining 88 are assigned to the more modern facility. The landfill site manpower requirements are staffed from the incinerator sites and are not formally kept separate as a cost factor. This fact contributes significantly to the very low landfill disposal costs inasmuch as personnel costs for such operations are approximately half of the total costs.

[1/] Assume a 300 day year.

TABLE 10
REFUSE DISPOSAL DATA - QUANTITIES AND COSTS

DISPOSAL LOCATION	MATERIALS RECEIVED	QUANTITY	COST	UNIT COST
#3 Incinerator	Mixed Refuse (Tons)			
	City	114,344		
	Private	11,540		
	Market Refuse	6,240		
	Street Dirt	1,642		
	Total	133,766	670,636	5.01
#4 Incinerator	Mixed Refuse (Tons)			
	City	194,626		
	Private	11,242		
	Market Refuse	2,301		
	Street Dirt	-		
	Total	208,169	1,056,147	5.07
Landfill	Mixed Refuse (Cu Yds) [1]	466,645		
	Street Dirt (Cu Yds)	336,497		
	Ashes (Cu Yds)	26,329		
	Bulky (Cu Yds)	63,978		
	Leaves (Cu Yds)	19,241		
	Mechanical Sweepers (Cu Yds)	32,823		
	Total (Cu Yds)	945,513	213,584	.23

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[1] The city reported a collection of 93,329 Tons. This has been converted assuming that one yard equals approximately 400 pounds.

5.6: Equipment Description

The mixed refuse collection division of the Division of Sanitation in Baltimore currently utilizes 162 rear load packers and 2 front loaders. Only 92 pieces of this equipment are operated for mixed residential collection on any single collection day with the remaining vehicles being used for street cleaning activities, held in reserve for replacement of damaged equipment, and in the shop for routine maintenance. In addition, a small proportion of this force is carried in the books but in reality is set aside waiting to be auctioned. Two Dempster Dumpsters are operated by the Sanitation Division in the neighborhood market areas. A limited number of open dump trucks are also employed in the market area and for other minor operations.

The streets division also employs a relatively large amount of equipment. The Sanitation Division has 103 open dump trucks available for service with four trucks being used for disposal activities, another small number being utilized by the mixed refuse division, and the remaining dump trucks are used by the street division for gang cleaning and Hokey Cart wastes. For the remaining street cleaning activities, the division operates twenty-five street sweepers and nine flushers. Twenty-four leaf loaders clean the streets of leaves and twigs in the Spring and Fall.

The disposal function of the division utilizes fifteen pieces of mobil equipment. At the landfill sites six heavy pieces of equipment are operated for excavation purposes. There are also five landfill compactors employed at these sites. The incinerator residue is hauled to the landfills in four large dump trucks.

In addition to the collection and disposal fleet, the Sanitation Division also uses a variety of other vehicles, which include: thirty-six automobiles, three pick-ups, one panel truck and three vans. These vehicles are used by management personnel and the supervisors who patrol the collection districts of the city. The Animal Shelter, which is operated by the Division, uses six paneled dog trucks in their activities.

5.6.1: Equipment Financing and Cost

As discussed in the financial section, the Sanitation Division rents their vehicles from the Motor Vehicle and Mechanical Shops. The actual cost breakdown on various pieces of equipment is shown in Table 11. As can be seen, the actual cost has a wide variance with respect to the average cost for all pieces of equipment and is considerably less than the $5.50 per truck-hour charge for all equipment.

TABLE 11

LIFETIME OPERATING COSTS FOR VARIOUS PIECES OF EQUIPMENT

	Number	Operating Cost Per Hr. Per Item
Refuse Collection		
Load Packers & Chassis	162	$ 4.681
Dempster Dumpster	2	5.128
Average	164	4.686
Refuse Disposal		
Landfill Excavation Equipment	6	$ 8.747
Compaction Equipment	5	7.582
Large Open Dump Truck	4	21.090
Average	15	11.650
Street		
Large Open Dump Trucks	99	$ 2.145
Leaf Loader	24	8.328
Street Sweeper	25	6.739
Flusher	9	11.005
Average	157	4.330
Other Vehicles		
Autos	36	$ .101*
Pick-ups	3	1.172*
Panel Truck	1	1.012*
Vans	3	1.097*
Paneled Dog Trucks	6	2.016*
Average	49	.481
Total All Pieces	386	$ 4.24

* In terms of cost per mile

SOURCE: Central Garage Master Cost Listing, Report Date September 30, 1972

The basic reason for this cost difference is that the depreciation schedule does not adequately reflect the cost of replacing old equipment. Rather, a separate fund entitled Reserve for Life is established which is a sinking fund for the replacement of depreciated equipment. The sources of revenue for this fund are the allocated depreciation expense and the excess revenue from the rental of the equipment. In reality a more rigorously constructed depreciation schedule would produce the same results.

Table 12 gives a further breakdown of the lifetime operating expenses for two different types of load-packers, based upon the year in which they were purchased. For the first three years of operation the operating cost within each class appears relatively constant. For vehicles older than three years, however, the cost increases fairly substantially as the vehicles presumably need major repairs. The cost differential between the two types of load-packers basically reflects the difference in the original purchase price and thus the depreciation expense.

TABLE 12

OPERATING COST[1] PER HOUR FOR TWO CLASSES OF LOADPACKERS, 1967-71

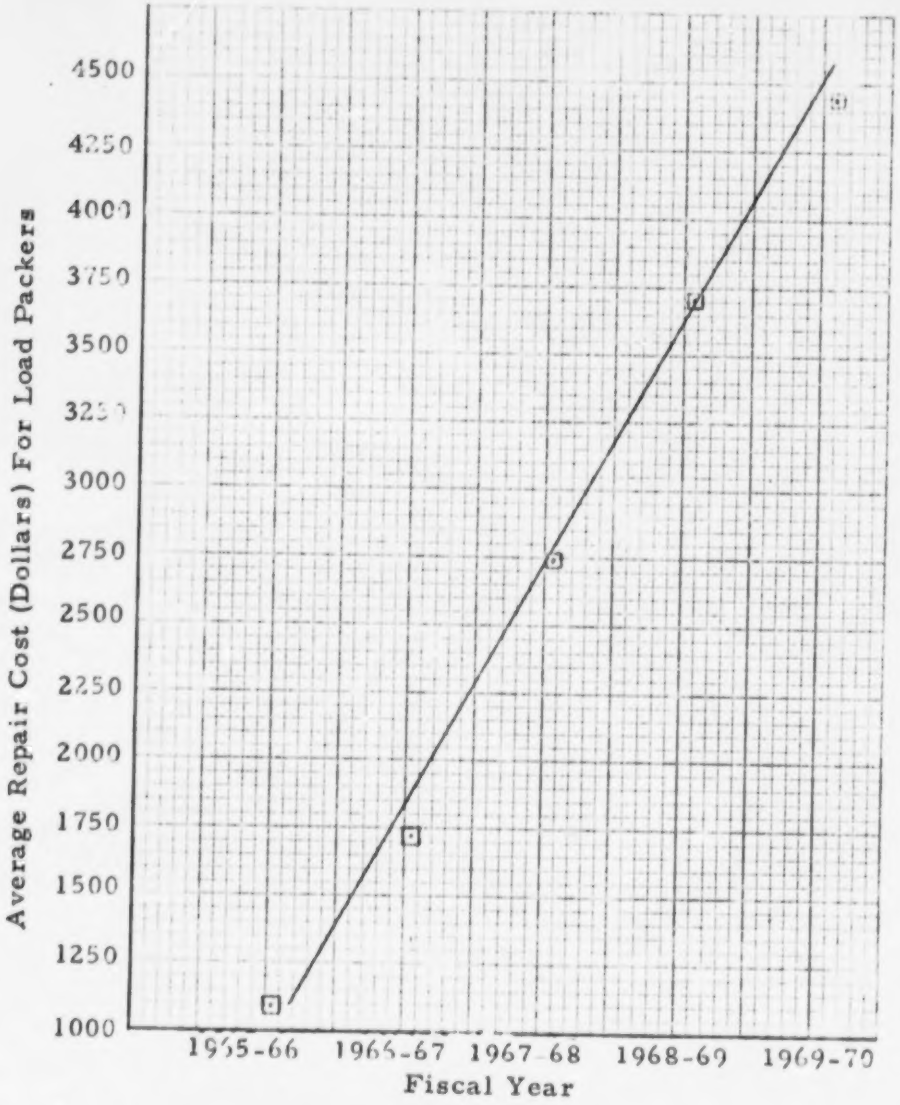
Year Purchased	Number Vehicles	Cost 107-11 Loadpackers[2] Per Hour Operated	Number Vehicles	Cost 108-11 Loadpackers Per Hour Operated
1967	24	5.57	2	4.01
1968	--	----	20	4.37
1969	19	4.92	4	3.37
1970	17	4.90	14	3.55
1971	2	4.80	13	3.64

[1] Total Cost = Gasoline, oil, materials, insurance, tires, accident, outside repair, depreciation, labor, and service charge.

[2] 107-11 and 108-11 are two different makes of loadpackers.

Source: Central Garage Master Cost Listing - Report Date September 30, 1972

Finally, data was provided on the average annual repair cost for twenty load packers purchased in the Fiscal Year 1965-66. These figures reflect the cost of labor and parts to repair the vehicles and are presented in Figure 7.



Source: Chief, Division of Motor Vehicle and Mechanical Shops

FIGURE 7: AVERAGE ANNUAL REPAIR COSTS DETERMINED FROM THE HISTORY OF TWENTY LOAD PACKERS PURCHASED IN THE FISCAL YEAR 1965-66

A comparison of the cost figures in Table 12 and Figure 7 would not be a valid comparison. The two illustrations are for two different data sets and represent substantially different time horizons. Table 12 represents the operating costs at one moment in time whereas Figure 7 represents the average costs over the lifetime of a vehicle.

5.6.2: Maintenance Policy

The daily operating maintenance of the vehicles is performed at the garages where the vehicles are kept. Each truck is thoroughly washed inside and out when it returns to the garage at the end of the workday. Gasoline and oil are also provided at these sites.

Once a month each vehicle is inspected at the central garage for any major mechanical defects. At the same time a major lubrication is performed on the hydraulic system and most moving parts. This once a month check-up also constitutes the major vehicle safety program employed by the city. It is the opinion of the central garage chief that this program is not sufficient to deter major mechanical failures. A more complete daily servicing would be required to lower the number of major mechanical repairs. All vehicles that incur major breakdowns are towed into the central garage or private repair shops.

5.6.3: Equipment Replacement Policies

The Sanitation Division works closely with the Motor Vehicle and Mechanical Shop Division when replacing existing rolling stock or expanding the fleet. The decision to replace existing vehicles is made by the Chief of the Motor Vehicle and Mechanical Shops. No elaborate procedures are used to reach this decision. A very simple economic rationale is employed: when the cost of repair exceeds the depreciated value of the vehicle, it is replaced. A five year economic life is considered normal with discarded vehicles being sold at auctions. The Chief of the Sanitation Division is notified of the vehicles needing replacement and he writes specifications for the new equipment. The specifications are delivered to manufacturers who must respond with sealed bids.

The decision to increase the size of the fleet is made by the Chief of the Sanitation Division. The expenditure for additional equipment must be appropriated through the operating budget as a separate expenditure. The same formal bidding procedure is followed for this equipment.

5.7: Financial Aspects of the Baltimore Solid Waste System

The municipal solid waste system of Baltimore has a very unusual method of funding. There are two basic sources of funds: General Funds and Motor Vehicle Revenues, each of which is assigned to a particular function within the system. The General Fund finances mixed refuse collection and all disposal activities and is generated primaily through property taxes. Motor Vehicle Revenues, on the other hand, are used exclusively for street related activities, primarily the beat patrol and gang sweeping operations. The revenue of this fund is derived from state collected taxes, fees, and licenses related to highway activities.

The Division's budgetary process is, on the surface, not very complex. Requests for upcoming budgetary needs are sent to all division heads at approximately the beginning of October for the July 1 fiscal budget. These requests are returned, processed by the Accounting Department, and a preliminary budget is delivered to the Division Chief by the first of the year. It is his responsibility to develop the final Division budget before it is sent to the Director of Public Works who approves it before submission to the Mayor and Board of Estimates. It is interesting to note that while the Division Chief is responsible for developing both the operating and capital budgets, it is the operating budget which receives the largest amount of attention. The Division's rolling stock expenses, both operating and replacement, are included in the operating budget, therefore the capital budget is very minor in most years. Items included in the capital budget are generally limited to new disposal sites or disposal plants. After the budget is approved by the Director of the Department of Public Works it is sent to the Board of Estimates for final approval before submission to the City Council.

In this section we identify each revenue source, presenting historical information wherever possible, including information on capital budget financing. Next, the level and types of expenditures made from each fund for each collection and disposal activity are examined. Expenditures are broken down in as much detail as was available and for presentation.

5.7.1: Sources of Revenue

As Table 13 illustrates, the mix of funds flowing into the Division of Sanitation's Operating Budget over the past six or seven years has changed considerably. Motor Vehicle Revenues now play a dominant role in the financing and significantly supplement the City's General Funds available to the Division. As a percentage of the total Motor Vehicle Revenues allocated to the city, the Sanitation Division's share has also increased considerably during this period. During the same period there have been only two capital budgets. Both of these occurred in the past two years (1971-72, 1972-73) and both were for disposal efforts. A discussion of the budget will be clearest, however, if each of the revenue sources, General Funds, Motor Vehicle Revenues, Bonds, and Subsidies/ Grants are individually discussed.

General Fund

The property tax is the backbone of the General Fund for the Division of Sanitation. As Table 14 illustrates, the proportion of revenue generated by other sources and allocated to the Division has been very small. These other revenues are basically charges to private companies for incinerator use and income from the sale of animals by the animal shelter.

TABLE 13: OPERATING BUDGETS BY FUNCTION AND SOURCE OF FUNDS; 1967-73

Year	General Funds					Motor Vehicle Funds		
	Collection		Disposal		Total General Fund Budget	Collection		Total Motor Vehicle Fund
	Dollar	% 2) G.F	Dollar	%		Dollar	% 3) MVF	
1972-73	5,211,504[1]	1.2	2,274,659	.5	416,472,768	6,705,722	16.9	39,480,791
1971-72	5,528,852	1.3	2,323,383	.6	406,304,604	6,103,898	18.0	33,771,539
1970-71	5,642,009	1.4	1,874,234	.5	386,643,000	5,790,409	16.5	34,882,252
1969-70	5,490,615	1.5	1,967,836	.5	359,961,151	5,730,855	16.3	35,116,485
1968-69	4,902,060	1.5	1,567,781	.5	325,474,956	4,085,909	13.8	29,423,028
1967-68	7,052,835	2.3	1,548,556	.5	304,094,727	610,000	2.7	22,184,517
1966-67	6,777,532	2.5	1,333,088	.5	266,687,619	292,000	2.5	11,364,898

1. Anticipated Budget Deficit of $741.715
2. As a percentage of the total General Fund available to the City
3. As a percentage of the total Motor Vehicle Funds available to the City

SOURCE: Baltimore Budget in Brief, Issues 1967-68 through 1972-73

TABLE 14: OPERATING REVENUE (OTHER THAN PROPERTY TAX) ALLOCATED TO SOLID WASTE COLLECTION AND DISPOSAL WITHIN THE GENERAL FUND; 1969-71

Year	Other Revenues	Total General Fund Collection and Disposal	Other Revenues/ as % of Total From the General Fund
1970-71	176,000	7,710,000	2.3%
1969-70	99,000	7,283,000	1.4%
1968-69	51,000	6,936,000	.7%

The tax base for the city of Baltimore has grown very little over the past ten years and at the same time there has been a net emigration of the populace. Table 15 illustrates the absolute level and rate of growth

TABLE 15: ASSESSABLE BASE AND TAX RATE (1961 to Fiscal 1963)

	Assessable Base			Tax Rate		
		Increase (Decrease) Over Prior Year			Increase (Decrease) Over Prior Year	
Year	Valuation	Amount	%	Rate Per $100	Amount	%
1961	2,757,866,348	(30,280,300)	(1.09)	3.60	---	----
1962	2,719,056,478	(38,809,870)	(1.41)	3.91	.31	8.61
1963	2,757,224,628	38,168,150	1.40	3.95	.04	1.02
1964	2,808,508,768	51,284,140	1.86	4.14	.19	4.81
1965	2,856,747,818	48,239,050	1.72	4.45	.31	7.49
Fiscal 1967	2,912,121,718	55,373,900	1.94	4.73	.28	6.29
Fiscal 1968	2,954,411,758	42,290,040	1.45	4.42	(.31)	(6.55)
Fiscal 1969	3,030,470,188	76,058,430	2.57	4.74	.32	7.24
Fiscal 1970	3,062,638,008	32,167,820	1.06	4.94	.20	4.30
Fiscal 1971	3,072,009,978	9,371,970	.31	5.34	.40	8.10
Fiscal 1972	3,097,243,148	25,233,170	.82	5.65	.31	5.81
Fiscal 1973	3,116,051,078	18,807,930	.61	5.86	.21	3.72

SOURCE: Budget in Brief; 1973

of the tax base and the tax rate on this property. The rapid and continual increase in the tax rate relative to the increase in the tax base indicates the relative stagnation of Baltimore's economy. Instead of relying on increased growth of the local economy for tax revenue, the city has been forced to rely on higher tax rates, which have increased over 62 percent during this period.

The apportionment of collected property tax revenue to the Division of Sanitation has been relatively constant for the years since 1969 averaging approximately 3.5 percent of the property tax dollars collected. This is illustrated in Table 16. The large deviation from the norm occurred in 1969, the year that Motor Vehicle Revenues were first allocated in strength to the Division. It is interesting to note that while this pattern did not continue, the amount of Motor Vehicle Revenues as a percentage of the total operating budget has increased from 47 percent to 57 percent during this period.

TABLE 16: APPORTIONMENT OF GENERAL PROPERTY TAX FOR SANITATION AND WASTE REMOVAL

	Property Tax Rate [1] Apportionment	Apportionment of each $1.00 of Property Tax
1973	.188	.032
1972	.198	.035
1971	.192	.036
1970	.168	.034
1969	.095	.020
1968	.125	.028

[1] This means that 18.8 cents of the $5.86 Property Tax Rate is apportioned to the Sanitation Division in 1973. This represents 3.2% of total tax rate.

Motor Vehicle Revenues

The source of Motor Vehicle Funds are state collected taxes and fees related to the use of motor highways, including motor vehicle fuel taxes, titling fees, and licensing fees. Baltimore is currently allocated 17.5 percent of these fees by the State. The city decides how it will allocate these funds among its departments, but they can be used only for street related activities. Prior to 1968-69 these funds did not contribute to the funding of manual street cleaning activities. However, on May 7, 1968, the Governor approved the enabling legislation for such a transfer of funds. Section 33, article 56 of the Annotated Code of Maryland now reads, "The monies distributed to Baltimore city under the provisions of section 38A shall be used... 3) to pay the costs incurred in other highway related activities of such city (Baltimore) in lighting highways, providing for storm water drainage of said highways, and providing for street cleaning not to include the cost of collection of garbage, trash, and refuse..." Subsequently, as Table 13 indicated, Baltimore City shifted a large percentage of their allocated Motor Vehicle Funds into the street cleaning operation of the Sanitation Division.

Bonds

For major capital projects, the Division of Sanitation relys on bonds as a method of financing. Prior to 1971-72 there was no capital budget. However, in the past fiscal year and in the current fiscal year there have been capital projects to repair and modernize existing disposal sites and acquire additional landfills. Last year (1971) a six million dollar capital budget based on a voter-approved bond issue was included in the Division of Sanitation's total budget. At this time no bonds have yet been sold.

For the current fiscal year (1972-73) the appropriated capital budget was 4.6 million dollars. The residents of Baltimore approved the following projects by a vote of 107,588 to 30,368 on November 7, 1972:

1.	Resource Recovery Facility - to recover iron and glass from the residue of the incineration process. The recovered material will be used by the city or will be sold	$1,000,000
2.	Northwest Transfer Station - for more efficient and economical use of collection crews and trucks working in the northwest section of the city. Now each filled truck must travel across town to be emptied, and then return. Transportation of refuse from the Transfer Station to its destination will be by large hauling truck or by train. Scheduled for funding in Fiscal 1973	$1,500,000
3.	Pennington Avenue Landfill - to replace the now filled Reedbird Landfill and the Bowley's Lane and Cold Spring Landfills which are near capacity, Scheduled for funding in Fiscal 1973	$1,700,000
4.	Demolition Debris Landfill - Private haulers will pay a fee to dispose of their demolition debris here. The fees should cover operating costs. Scheduled for funding in Fiscal 1973	$ 400,000

All bonds issued by the Department of Public Works are general obligation issues.

Subsidies/Grants

The final source of funds involves Federal and State grants to the city. The Environmental Protection Agency recently awarded Baltimore a six million dollar demonstration grant for the construction of a new pyrolysis disposal plant. The balance of the cost of construction, approximately $7-8 million will be shared by the Maryland Environmertal Service and the city. The city plans to fund its share of the project from internal sources. Revenue gained from the sale of Friendship Airport to the state is one possible source of funds. This money is unallocated and goes into the Mayor and City Council Real Property Account. The pyrolysis plant is expected to be completed by 1975 or 1976 and will be capable of handling 1,000 tons of waste per day.

5.7.2: Expenditures

The expenditures of the Division of Sanitation are monitored by means of regular monthly accounting statements distributed to each superintendent within the Division. There are three different levels of this report, each describing total expenditures at varying degrees of detail. The level I report merely describes the total expenditures by the division for the month. The level II report breaks these expenses down by the activity performed and major expense categories under this heading. For solid waste collection activities operating under the General Fund, the level II report would include mixed refuse collection, market-jail refuse collection, ashes, bulky trash, waste oils and grease, garage properties, and the repair shop. A similar breakdown is available for street collection activities. The expenses broken out correspond to those shown in Table 17. The major expense items for both collection and disposal are the direct and indirect wage expense and contractual services. A more complete discussion of these accounts is presented later. The final accounting report, level III, records all expenditures made by the department in the past month. These records are backed by the receipts of each expenditure to account for all cash flow.

TABLE 17: OPERATING BUDGET BREAKDOWN OF EXPENDITURE BY FUNCTION

Year Activity	Salaries & Wages	Other Personnel Costs	Contractual Services	Materials & Supplies	Equipment Replacement	Equipment Additional	Grants and Subsidies	Debt Service	Cap. Imp. Unav. Cr.
1973									
Refuse	4,094,997	579,368	1,254,494	23,400	960	-	-	-	(741,715)
Street	5,135,539	706,796	817,137	18,250	-	28,000	-	-	-
Disposal	1,457,345	226,312	392,335	49,350	335	-	-	463,270	(314,288)
1972									
Refuse	4,038,956	483,146	1,190,272	15,325	-	-	-	-	(218,847)
Street	4,653,668	512,700	921,930	15,600	-	-	-	-	-
Disposal	1,308,772	156,119	356,160	55,050	-	70,000	-	377,282	-
1971									
Refuse	3,921,850	578,209	1,123,800	18,150	-	-	-	-	-
Street	4,538,401	567,738	665,770	18,500	-	-	-	-	-
Disposal	1,214,335	140,741	261,850	61,840	780	13,750	-	180,938	-
1970									
Refuse	3,866,230	498,270	1,110,515	14,950	650	-	-	-	-
Street	4,313,884	518,231	694,320	28,020	-	182,400	-	-	-
Disposal	1,127,691	136,572	453,485	64,800	1,350	-	-	183,938	-
1969									
Refuse	3,320,359	432,051	1,061,850	15,800	-	72,000	-	-	-
Street	3,191,901	392,766	425,722	18,020	-	57,500	-	-	-
Disposal	976,162	109,441	222,040	73,200	-	-	-	186,938	-

SOURCE: Budget in Brief; 1969-1973

The expenses of the collection and disposal units are significantly different. To more adequately define the expenditures for both collection and disposal, each activity will be separately discussed.

Collection Activities

As Table 17 indicates, the major item of expense for both mixed refuse collection and street cleaning is the direct wage expense. For street cleaning the wages comprise 76-77 percent of the total budget. The comparable figure for mixed refuse collection is only slightly less at approximately 70 percent. An interesting fact is noticed when the total wage bill for collection activities is compared over the years. As Table 18 indicates, street cleaning (Motor Vehicle Funds) now represents a larger portion of the total wage bill than mixed collection.

TABLE 18

TOTAL PERSONNEL COST FOR
ACTIVITIES SPLIT BY COLLECTION
SOURCE OF FUNDS, 1969-73

Year	Type of Fund	Salaries and Wages	Other Personnel Costs	Total Wage Bill	Fund % of Total
1973	General	4,094,997	579,368	4,674,365	44.4%
	Motor Vehicle	5,135,539	706,796	5,842,335	55.6
1972	General	4,038,956	483,146	4,522,102	46.7%
	Motor Vehicle	4,653,668	512,700	5,166,368	53.3
1971	General	3,921,850	578,209	4,500,059	46.8%
	Motor Vehicle	4,538,401	567,738	5,106,139	53.2
1970	General	3,866,230	498,270	4,364,500	47.5%
	Motor Vehicle	4,313,884	518,231	4,832,115	52.5
1969	General	3,320,359	432,051	3,752,410	51.1%
	Motor Vehicle	3,191,901	392,766	3,584,667	48.9

Other Personnel Costs are also a major segment of the operating budget for each activity, running well in excess of half a million dollars for each of the last three years. The Other Personnel Costs include payments of Federal Insurance Contributions Act (F.I.C.A.), Retirement, Health Insurance, Workmen's Compensation, and Health and Welfare. One particularly interesting component of this total is the payment for workmen's compensation which has averaged about 30 percent above the Division's allocated budget. As Table 19 indicates, the Division of Sanitation has made payments for workmen's compensation and hospitalization which have averaged approximately 30 percent of the city's total expense for these items for all employees. At the same time, the Division employs only 1,500 of approximately 37,000 full and part-time city employees.

TABLE 19: WORKMEN'S COMPENSATION EXPENSES AND HOSPITALIZATION PAYMENTS FOR DIVISION OF SANITATION

Year	Activity	Amount Paid Workmen's Compensation	Amount Paid Hospitalization	Total Each Division	Total Sanitation Dept.	Total City Expense Workmen's Compensation
1971	Collection	168,400	48,007	216,407	263,337	848,691
	Disposal	30,679	16,251	46,930		
1972	Collection	225,043	74,520	299,563	355,480	1,095,912
	Disposal	39,130	16,787	55,917		

SOURCE: Workmen's Compensation Officer, City Hospital of Baltimore

The major portion of the contractual service expenditure is paid to the Motor Vehicle and Mechanical Shops. The Division of Sanitation purchases the rolling stock and then gives the vehicles to the shops for maintenance, repair and replacement. The Division then rents the equipment from the garage at a set rate, currently $5.50 per truck-hour. A breakdown of the items which compose this rate and their share of this rate is shown in Figure 8. Depreciation accounts for approximately 50 percent of the total rental cost. The current depreciation period for the collection vehicles is six years. However, within the past year the depreciation period was shifted from an eight year schedule. Straight-line depreciation is used as there is no financial incentive to employ rapid depreciation schedules. The accumulated depreciation expense is placed in a sinking fund for replacement of vehicles. The decision to replace existing vehicles is made by the Chief of the Motor Vehicle and Mechanical Shops.

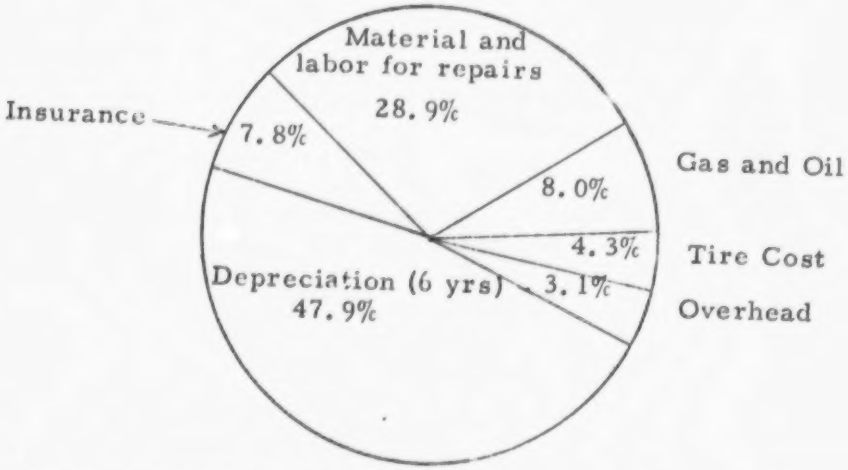


FIGURE 8: BREAKDOWN OF THE MOTOR VEHICLE RENTAL CHARGE BY EXPENSES

The remaining expenditure categories are very minor for the collection sector of the Division of Sanitation. However, a fact should be noted concerning the expenditures for additional equipment. A decision to increase the size of the existing fleet is made by the Chief of the Sanitation Division and the expenditure for these vehicles is appropriated and made through the operating budget. Thus, there are no capital expenditures as there is no capital budget for the Division. Rather, what could be considered capital expenditures for additional rolling stock are contained in the annual operating budget and expensed as operating costs.

One final item of information is the surplus or deficit of each budget. In Table 20 these figures are presented for each year since 1967 by the type of fund. Interestingly, the General Fund budget generally runs a deficit while the Motor Vehicle Revenue budget has never been overrun. The last columns present the total surplus or deficit for the entire collection department. Motor Vehicle Revenue cannot be used to eliminate any General Fund deficit. Any surplus is transferred back to the general highway Motor Vehicle fund for reallocation.

Disposal

The disposal phase of Baltimore's solid waste management system is the least expensive phase of the operation. Referring back to Table 13, the allocated budget for the current fiscal year is $2,274,659, representing 16 percent of the total solid waste budget.

A breakdown of annual expenses by the type of disposal activity is presented in Table 21. An examination of this table presents an interesting picture of the disposal activities. The only disposal activity which currently has debt service is incinerator #4. The large increase in this value for 1971-72 results from the $6,000,000 capital expenditure for repairing and modernizing the incinerator.

The direct wage expense is a smaller percentage of the operating budget for disposal activities than for collection activities. For the past three years, the direct wage expense has averaged approximately 60 percent for the disposal operating budget. This is considerably less than the 70-75 percent direct labor expense in either of the two collection functions.

The contractual expenses for the two incinerators differ significantly for all three years. However, the #3 incinerator also has a landfill on the grounds, which explains the magnitude of this difference. For fiscal year 1970-71, the cost of renting motor vehicles alone was $2,452 for incinerator #3 and $97,228 for incinerator #4. The latter figure depicts the cost of transporting the residue from incinerator #4 to a landfill.

TABLE 20

ANNUAL EXPENDITURES FOR WASTE COLLECTION, THE AMOUNT AND PERCENTAGE IN EXCESS (OR DEFICIT) OF BUDGETED FUND BY ACTIVITY AND SOURCE OF FUNDS, 1967-72

Year	Refuse Division				Street Division				Total Expenditures		
	General Fund	Motor Veh. Fund	Surplus or Deficit	% Surplus or Deficit	General Fund	Motor Veh. Fund	Surplus or Deficit	% Surplus or Deficit	Total Expenditure	Surplus or Deficit	%
7/71-6/72	1) 5,856,025	-	(327,173)	5.9	-	6,100,643	3,255	.1	11,956,668	(323,918)	2.8
7/70-6/71	5,722,000	-	(79,991)	1.4	-	5,783,000	7,409	.1	11,505,000	(72,582)	.6
7/69-6/70	5,360,000	-	130,615	2.4	-	5,317,000	419,855	7.3	10,677,000	550,470	4.9
7/68-6/69	5,297,000	-	(394,940)	8.1	-	3,972,000	113,909	2.8	9,269,000	(281,031)	3.1
7/67-6/68	4,853,919 2)	-	(453.117) 3)	6.4	2) 2,652,033	610,000	0	0.0	8,115,952	(453,117)	5.9
7/66-6/67	4,456,633	-	(336,529) 3)	5.0	2,657,428	272,509	19,491	6.7	7,386,570	(317,038)	4.5

1) All figures are projected based upon 3/4 yr. expenditure rate
2) Estimated as exact figures were not availabe
3) Total deficit of street cleaning and refuse collection general fund from the total general fund budget

SOURCE: Budget in Brief 1967-72 and Annual Reports 1967,1968,1969,1970,1971; Department of Public Works.

The demolition landfill was originally set up to handle all construction waste by-products. It should be self-supporting but, as seen in Table 21, this has not been the case.

Table 21

ANNUAL EXPENDITURES FOR WASTE DISPOSAL ACTIVITIES BY DISPOSAL OPERATION AND GENERAL COST ACCOUNTS, 1970 - 72

Year	Disposal Operation	Salaries & Wages	Other Personnel Costs	Contractual Services	Materials & Supplies	Equipment Replacement	Equipment Additional	Debt Service	Total
1971-72	#3 Inc.	508,545	87,488	16,723	17,690	1,879	113	-	632,438
	#4 Inc.	593,409	97,494	175,867	37,283	-	67,163	480,582	1,451,798
	Landfill	116,600	14,381	72,193	48	-	-	-	203,222
	Dem. Landfill[1]	18,624	2,460	30,941	1,205	-	-	-	53,230
1970-71	#3 Inc.	514,533	90,043	18,641	20,263	15,064	27	-	658,571
	#4 Inc.	556,380	78,949	154,318	38,667	89	-	108,938	937,341
	Landfill	98,688	11,574	80,604	-	-	14,978	-	205,844
	Dem. Landfill	16,006	1,707	29,834	314	-	-	-	47,861
1969-70	#3 Inc.	483,854	62,307	13,793	16,522	117	-	-	576,593
	#4 Inc.	536,089	55,758	116,724	29,918	3,686	-	183,938	926,113
	Landfill	93,890	12,027	100,10	19	-	-	-	206,040
	Dem. Landfill	5,114	502	10,642	166	-	-	-	16,424

1) Demolition Landfill

SOURCE: Level II accounting statements for June 30, 1970-71-72.

5.8: Different Views of the Baltimore Solid Waste Management System

A variety of personnel who represent different interest groups in Baltimore were interviewed, and their perspectives of the general solid waste management system were found to be fairly uniform. Different emphasis, however, was found for each group on the variety of solid waste management issues of importance within the city. For the most part, interviews were internal to the city government. Several important factors were uncovered. Two groups external to the city government, but representing important viewpoints were AFSCME Local 44 and the Women's Civic League.

5.8.1: Groups Internal to the Baltimore Government

Department of Public Works

The Department of Public Works has the ultimate responsibility for the collection and disposal of solid waste. At the same time, however, it is also responsible for the maintenance of many other city services, and consequently the Sanitation Division represents only a small fraction of its total responsibilities.

However, since the collection and disposal of solid waste is an issue in the city, considerable time and effort have been devoted to these problems by members of the Public Works' senior staff. These thrusts are not directed at the operational levels as these tasks are the responsibility of the various division heads that affect solid waste management activities. Consequently, the day-to-day picture of solid waste management activities appear to be of minor interest to upper-level management.

The major interest of the Department of Public Works is to secure funding for solid waste management activities. There has been remarkable success in this endeavor. The most immediate event was the successful effort to fund a new disposal site by principally external sources. This facility is estimated to cost $14 million dollars, with $6 million being supplied by the Environmental Protection Agency and $4 million coming from state funds. The remainder will come from the Mayor and City Real Property Account. Additionally, the new disposal facility will have an offsetting source of income, because the waste will be used to supply steam to the local gas company.

Of comparable importance was the apparent ability to secure state funds (Motor Vehicle revenues) to support the street cleaning activities in the city. This event is somewhat less clear because the Motor Vehicle revenue was an existing fund source of the Sanitation Division prior to the year in which the billing procedure was changed. However, it is notable that, while this revenue source doubled for the city as a whole between FY 1968-1969 and FY 1969-1970, the share for sanitation activities (street cleaning) rose by a factor of about six. At the same time, the city's sanitation budget dropped from in excess of $7 million to about $5 million. Since that time city support of activities related to solid waste collection have remained essentially constant, whereas State support for street cleaning has risen by almost $2.5 million.

The Department of Public Works is now considering several other projects related to solid waste management. Of paramount interest is the Regional Solid Waste Management Plan which must be submitted to the State by July 1 of 1973. In view of the historical difficulties of disposal site procurement and the recent disposal site windfall, the city must take care during the negotiations that will produce this document. Concurrently, the Department of Public Works is planning for a transfer station located in the proximity of the Northwest sector. An installation of this type will reduce the travel time for collection vehicles working that area and respectable cost savings are expected. The city is also exploring recycling technology as another means to defray costs, but implementation is not viewed as immediately probable.

Division of Sanitation

The Division of Sanitation has the specific responsibility for the collection and disposal of the solid waste generated in the city. There are a variety of problems that the Chief of the Division of Sanitation has stated as important. Foremost among these is the observed shift of the waste source from mixed residential to vagrant (street) wastes. The Chief feels that the people of the city are not responding to the needs of the division by proper containerization and storage methods and are, in fact, becoming more casual in their attitudes regarding these points. On the statement that "EPA is considering major technical assistance for those cities that...", his response indicated that a "program to educate residents" is what is needed. This statement has some merit, as this viewpoint was reiterated by other interviewees. In support of this conclusion, it was offered that the residents have far fewer storage containers (40 twenty-gallon cans per sixty-dwelling units) than were required. In view of the prescribed ordinances, he was asked if the maximum of 4 twenty-gallon container/dwelling unit rule was observed. The response was "no." To be effective, his personnel are informally instructed to pick up waste stored in whatever container is used. To summarize this point, the management of the Division of Sanitation feels that the improper storage of solid waste results directly in the rise of vagrant waste and that this critical problem requires a solution.

A second problem area that was stressed by the Division of Sanitation was the rising incidence of absenteeism, turnover, and abuse of Workmen's Compensation by personnel in the mixed residential collection function. The first two difficulties are not uncommon in waste collection activities, while the Workmen's Compensation abuse appears to be a new problem. Additionally, it was stated that the "task" incentive system was required to keep personnel reasonably satisfied. An additional policy is that the mixed residential refuse collection has priority, thus any lack of personnel to perform this function is made up from the street sweeping personnel.

During the course of case study interviews, it was determined that the staff requirement for street sweeping activities was very large. This fact suggested that the city had accepted the role of "employer of last resort" and public job support (PJS) was being practiced. When this issue was approached, the Chief of the Sanitation Division said that this was not the case and the large staff was required to maintain an acceptable level of cleanliness in the streets. In support of the question on PJS he also said that the staff performing the street cleaning operation was being cut back by attrition and that there were now 200 less personnel than at the beginning of the year.

This condition suggested that there may be future problems with the union representing the blue collar workers. However, questioning along this line revealed that this was not so, as union officials were realistic about staffing and budget issues. In fact, it was stated that there was an excellent working agreement with the union. This arrangement is further supported by the real grievance procedure in operation. Although there is a formal procedure, this is not generally used and matters of involuntary separation of employees are resolved between appropriate union and sanitation personnel. The price that the city apparently must pay for the flexibility is that staff reductions are performed by attrition.

The Division of Sanitation currently recognizes three pressures which affect its operations. The city Department of Health, by its ruling on plastic storage containers, appears to have contributed to the rise of street waste. Although this factor is not regarded as the principal cause of street waste, the Division is maintaining a low-key dialogue with the Department of Health to find a solution to the ban on plastic containers.

A second pressure is the aggregate of the surrounding counties which have forced Baltimore to solve its disposal problems within the city limits.

A third and very significant pressure is the financial process within the Department of Public Works. It appears that the Division of Sanitation is given a budget limit prior to submission of their budget estimates. This constraint implies that priority items receive funding and other problems are set aside for the following years. This situation doe's not allow for flexibility and is a deterrent to innovative approaches to improve the level of service and maintain costs.

Motor Vehicle and Mechanical Shops

The purpose of the Division of Motor Vehicle and Mechanical Shops is to maintain existing city equipment and replace items when necessary. The city owns about 2500 pieces of equipment, of which about 380 are assigned to the Sanitation Division.

There are two problems regarding the sanitation operation that are of particular interest to the Division of Motor Vehicle and Mechanical Shops. Of prime concern is the depreciation schedule for collection vehicles of 72 months as compared to the real equipment lifetime of approximately 60 months. This problem is particularly important for the packer vehicles. The Division is currently restructuring the depreciation schedule to reflect more realistic equipment lifetimes.

The second problem is the treatment that the vehicles receive at the hands of their operators. It is felt that the equipment faces premature failure because of the lack of adequate training and the careless attitudes of the drivers and the helpers. There is no apparent strategy planned to ameliorate this situation.

Training Officer, Department of Public Works

The training provided for personnel within the Division of Sanitation has two major thrusts, neither of which is directly related to job safety.

There are supervisory training programs given to supervisory personnel to teach them the basic management skills required for the job. These are said to be 20-hour courses given off-the-job but during working hours. Somewhat related to this effort was an adult education program that was provided for minority personnel to enable them to acquire the reading proficiency required to take the Civil Service examination for a supervisory job.

The second major training program is administered at the skilled and unskilled levels. This is a skills-oriented effort and provides information required for the proper and safe operation of the different equipment utilized by the Division of Sanitation.

Personal safety is emphasized in neither of these programs although it is felt that proper equipment operation is, by definition, safe. This may not be, as is reflected by the rising costs of Workmen's Compensation. It was reported that the Department of Public Works has been authorized a Safety Officer position but that it has not been filled and this is felt to be a problem.

Safety Director, City of Baltimore

The Safety Director of the city considers the waste collection effort to be very unsafe. He feels no real safety devices are provided on the city's equipment and that cost constraints prohibit the Division from purchasing safer equipment. To dramatize the need for such equipment, he pointed out that a manufacturing concern would be closed immediately if they operated a device similar to the swinging gate on rear loaders without providing safety features to the workers.

One provision which they have tried several times to have implemented by the Division is for all workers to wear safety shoes. This would at least provide protection to the workers' feet. Cost constraints, on both the Division and workers, have prevented this proposal from gaining acceptance. Their general impression of the Division is that safety and associated costs are traded off against cost pressures, continually forcing safety factors to be neglected.

Department of Health

The Department of Public Health has two main interests in solid waste management activities. The first of these is the method by which waste is stored for collection. The second relates to aspects of disposal.

In 1957, it was demonstrated that rodents could chew through the walls of plastic garbage containers being marketed. Since rat problems are of prime concern, such containers were banned. The Department of Health currently maintains a laboratory to test different plastic containers as they appear on the market. Field tests are also performed. It was stated that no containers have passed either test. The conclusion is that no plastic storage container is deemed impervious to hungry rats. This result may be biased, since test areas are cleaned up and the subsequent reduction in the food supply forces the rats to attack the plastic.

For the same reason, the use of plastic bags as the primary storage container is also banned. The exception to this rule is that plastic bags can be used as liners for metal containers. This is not widely practiced.

The head of the Department of Health is aware that the no-plastic ban is impacting the solid waste management system, and he maintains some contact with the chief of the Division of Sanitation. This has yet to be fruitful. However, he has stated that the Department is open to any suggestion that will satisfy the rat-proof requirement.

The second concern of the Department of Health relates to pollutants arising from disposal practices. In particular, there is some concern over the disposal of chlorinated hydrocarbons as these materials are being found in increasing quantities in solid waste. A specific item mentioned was the transparent meat containers that are now being used with increasing frequency by chain stores. These trays are said to be fabricated from polyvinylchloride which, when burned, gives rise to chlorine radicals in the combustion products. Similarly, if landfill is used, there is some concern over the biodegradability of this material. The Department of Health has not yet acted on these problems.

5.8.2: Groups External to the Baltimore Government

Representatives of two groups were interviewed for their views of solid waste management activities in Baltimore. AFSCME Local 44 provided necessary information from the union's perspective and the Women's Civic League was contacted for the nonpartisan citizen perspective.

AFSCME Local 44

As suggested in the section discussing the view of the Sanitation Division, there is a good working arrangement between the city and the union. This is a matter of convenience for both, as there is considerable give-and-take on both sides. This may be a result of the youth of the agreement as well as the fact that the principals of both groups worked their way up through the same ranks.

Both the Sanitation Division and the union share several opinions regarding the operation. Significantly, the union also claims that public job support is not an issue and the current staff is required for the variety of collection and disposal activities. Additionally, however, it was stated that prior to the loss by attrition of several hundred laborers, the system was about 20 percent overstaffed. The reasons for this condition were said to be the existence of the spoil system (patronage of sorts) and the problem with compensation for absenteeism.

The union was asked to comment on the "task" incentive system that is currently being utilized in the mixed refuse collection function. It was stated that this incentive is necessary due to the arduous nature of the job and that without such an incentive, staffing problems would increase.

Absenteeism and turnover were discussed as issues. The union feels these problems have roots in several factors, the principal one being the difficulty of the work. Of comparable importance is that many workers have another job in addition to solid waste collection and that this is very tiresome over long periods of time.

There are two immediate problems that the union feels are important. Primarily, there is the goal to increase the net wages of their constituents by persuading the city to finance a greater portion of the retirement fund payments. This would result in a net increase of about 10 percent in the take-home pay of a worker. A second factor which is disturbing to the union is the lack of safety training provided to personnel by the city. It is felt that the high accident rate stems from this neglect and could be significantly reduced with proper safety programs. Additionally, it is felt that the condition of the transportation equipment is poor which contributes to this problem.

Women's Civic League

The Women's Civic League has had an ongoing interest in the solid waste management activities of Baltimore for over sixty years. Of particular interest to this organization is street appearance, disposal problems, and recycling efforts.

Of significance is the fact that the League shares the opinion of the Division of Sanitation regarding citizen attitudes. It was stated that public attitude has been on the decline and that this fact is responsible for the rise in street litter. It was suggested that the high level of service offered in some sectors of the city was a contributing factor. For example, the proper storage of waste is not encouraged if the city is willing to clean up people's thoughtless discards. Similarly, the shifting roles of packaging technology and the rise in concentration of carry-out food establishments have contributed to the problem. Lastly, it is felt that the city is too lax in enforcement of existing litter laws and that such action would help reverse the trend of rising street litter.

The question of the use of plastic storage containers was discussed, and the League is in favor of promoting their use. The reason for this opinion is that plastic containers are far more durable and will, therefore, require less frequent replacement. The League is also aware of the fact that there is an insufficient number of containers serving the needs of the city.

Another interest of the Women's Civic League is the concept of recycling. Their opinion is that this practice represents the most sound disposal policy, and they are attempting to encourage its implementation. Several problems have been observed, again related to citizen attitudes. Primarily, it has been found that many citizens are not willing to expend any effort to sort and transport the waste fractions to the recycling centers. It is felt that there is no immediate solution to this problem. Of equal importance is the fact that recycling centers have been targets of vandals, and at least one center was shut down because of extensive damage.

The League has always been aware of the disposal problem. Although it does not appear to have significant impact on the operations of disposal, it has been helpful to the city by advertising the disposal problem. The most recent solution, the pyrolysis machine, is felt to be a milestone and is an attractive approach because of the energy recovery aspect.

APPENDICES

APPENDIX A: BALTIMORE CITY SANITATION CODE

REPRINT

of

ARTICLE 23

of

THE BALTIMORE CITY CODE

Article 23

SANITATION

Engineer

1. Duties
2. Collection of ashes.
3. Garbage and mixed refuse; receptacles.
4. Same; handling.
5. Same; collection.
6. Same; definitions.
7. Same; other matter.
8. Receptacles on collection days.
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12. Collection of refuse.

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14. Unlawful to leave.
15. Burning.

Vehicles

16. Dead animals.
17. Coverings.
18. Construction.
19. Drivers, employees.
20. Loads.
21. Penalty provisions.
22. Private vehicles

Water

23. Flushing streets.

Engineer

City Code, 1893, art 48, sec. 187. 1927, art. 44, sec. 3; 1950, art. 31, sec. 1.
Ord. 6, Feb. 21, 1882; Ord. 21, April 6, 1887;
Ord. 478, 1909-10; Ord 402, 1948-49.

1. Duties.

The Sanitary Engineer shall have charge of the following services in so far as such services or any of them are authorized or required to be done by the City;

1. The cleaning of the public streets, lanes, alleys and markets;
2. The collection and removal of ashes, garbage, rubbish and street dirt;
3. Such other municipal services as may be assigned to the Bureau of Sanitation by the Director of Public Works from time to time.

Nothing in this section shall be construed to require the Sanitary Engineer to remove snow or ice from the sidewalks binding on school or park properties.

Baltimore v. Hampton Court Co., 126 Md. 341.

City Code, 1927, art. 44, sec. 4; 1950, art. 31, sec. 2. Ord. 55, 1915-16;
Ord. 955, 1949-50, sec. 4; Ord 578, 1952-53, sec. 2(a).

2. Collection of ashes.

(a) *Duties.* It shall be the duty of the Sanitary Engineer to collect all ashes from dwelling houses, apartment houses and tenement houses, not exceeding the contents of sixteen ten gallon containers per week from each such house, as hereinafter provided.

The ash contents of eight ten-gallon containers shall be collected from each dwelling house, apartment house or tenement house on each of two different days during each week, except when a regular collection day falls on a holiday and no collection is made on that day, and in that event, the ash contents of sixteen ten-gallon containers shall be collected on the next regular collection day. For the purpose of this section the word "week" shall be taken to mean "Monday to Saturday, both inclusive, in each calendar week." When the next regular collection day falls in the following calendar week, as herein defined, the aggregate quantity to be collected in said following week shall be the ash contents of twenty-four ten-gallon containers, the first collection to be the contents of sixteen containers and the second collection to be the contents of eight containers. Provided, however, that it shall not be the duty of the Sanitary Engineer to collect any ashes from any place other than a dwelling house, an apartment house or a tenement house

(b) *Receptacles.* All ashes which are to be collected by the Sanitary Engineer shall be placed in separate receptacles made of metal or other durable material not affected by weather conditions, with handles and close-fitting covers, having a capacity of not less than three gallons nor more than ten gallons, and shall be so constructed that the contents may be removed therefrom easily and without delay.

Baltimore v. Hampton Court Co., 126 Md. 341.

City Code, 1950, art. 31, sec. 3. Ord. 955, 1949-50, sec. 5.

3. Garbage and mixed refuse; receptacles.

Occupants of dwelling houses, proprietors of boarding houses, hotels, restaurants and other places where garbage or mixed refuse is accumulated, and owners, agents and occupants of apartment or tenement houses shall provide for the use of such premises a sufficient number of receptacles to contain all garbage or mixed refuse which may accumulate on said premises during the usual interval between the collections of garbage or mixed refuse therefrom, and shall keep such receptacles at all time in good repair. Each receptacle shall be made of metal or other durable material not affected by weather conditions, with handles and close-fitting covers, having a capacity of not less than three nor more than ten gallons if garbage only is placed therein, and not more than twenty gallons if mixed refuse, as hereinafter defined, is placed therein, and shall be so constructed that the contents may be removed therefrom easily and without delay.

City Code, 1879, art. 23, sec 92; 1893, art. 48, sec. 189; 1927, art. 44, sec. 8; 1950, art. 31, sec. 4. Ord. 138, 1915-16; Ord. 564, 1918-19, sec. 9; Ord. 955, 1949-50, sec. 6.

4. Same; handling.

Occupants of any dwelling house, apartment or tenement house, and each proprietor of any boarding house, hotel, restaurant and other place where garbage or mixed refuse is accumulated, shall cause all such garbage or mixed refuse from such premises to be put into the receptacle or receptacles provided for that purpose, as required by Section 3. Each person aforesaid shall cause each such receptacle to be kept covered continuously, except when it is being filled or emptied, and shall cause each such receptacle to be placed in such position as to be easily accessible to the collector, or in such manner and at such time or times as may be designated by the Sanitary Engineer. All garbage and mixed refuse shall, at all times, be kept as free from dishwater and as dry as practicable.

City Code 1950, art. 31, sec. 5. Ord. 955, 1949-50, sec. 7; Ord. 578, 1952-53, sec. 5; Ord. 872, 1965-66.

5. Same; collection.

(a) *Collections.* It shall be the duty of the Sanitary Engineer to collect all mixed refuse from all dwelling houses, apartment houses, tenement houses, boarding houses, hotels, restaurants, hospitals and other places where mixed refuse is accumulated, not exceeding the contents of eight twenty-gallon containers per week for each such place, as hereinafter provided. The mixed refuse contents of four twenty-gallon containers shall be collected from each such place on each of two different days during each week, except when a regular collection day falls on a holiday and no collection is made on that day, and in that event the mixed refuse contents of eight twenty-gallon containers shall be collected on the next regular collection day. For the purpose of this section the word "week" shall be taken to mean "Monday to Saturday, both inclusive, in each calendar week." When the next regular collection day falls in the following calendar week, as herein defined, the aggregate quantity to be collected in said following week shall be the mixed refuse contents of twelve twenty-gallon containers, the first collection to be the contents of eight containers and the second collection to be the contents of four containers. It shall be the duty of the Sanitary Engineer to collect all garbage, without limitation as to quantity, from all such places when placed in separate receptacles.

(b) *Restrictions.* The above limitations of eight twenty-gallon containers per week or four twenty-gallon containers per collection day may be exceeded by the Sanitary Engineer for certain multiplefamily structures, other than apartment structures originally built as apartment structures, provided he is authorized to do so by the Board of Estimates which shall base such authorization upon consderation of public health, safety and welfare.

City Code, 1927, art. 44, sec. 11, 1950, art. 31, sec. 6. Ord. 564, 1918-19, sec. 9C; Ord. 955, 1949-50, sec. 8.

6. Same; definitions.

(a) *Garbage.* The term "garbage" as used in this Article shall be held to include every accumulation of animal, fruit or vegetable food waste generated by or resulting from the decay, deterioration, storage, preparation or handling of animal and vegetable matter in any place or at any point where food is prepared or served for human consumption, including all kitchen and dining refuse produced by households, hotels, restaurants, lunch rooms, clubs, hospitals or any other source whatsoever existing in Baltimore City.

(b) *Mixed refuse.* The term "mixed refuse" shall be held to include garbage as herein defined, mingled with any one or more of the following: paper, pasteboard, rags, mattresses, furniture, clothing, shoes, rubbers, leather, carpets, broken glass, crockery, bottles, straw, excelsior, metal, packing boxes and barrels, broken parts thereof, tin cans, Christmas trees, leaves and grass cuttings.

City Code, 1927, art. 44, sec. 10; 1950, art. 31, sec. 7. Ord. 564, 1918-19, sec. 9B; Ord. 955, 1949-50, sec. 9.

7. Same; other matter.

It shall be unlawful to place or cause to be placed with garbage, or mixed refuse, any ashes, plaster, yard or garden dirt, and where such mixture is found in any receptacle, it shall be the duty of the occupant of the premises properly to separate the ashes, plaster, yard or garden dirt from the other contents.

City Code, 1950, art. 31, sec. 8. Ord. 473, 1948-49.

8. Receptacles on collection days.

It shall not be lawful for any person or persons to have, keep or maintain upon any street, lane, alley or other public place within the limits of this City, any box, bin, barrel or other receptacle for the reception of garbage, ashes, litter, or rubbish of any sort, except that in order to facilitate the removal of garbage, ashes, litter, or rubbish on the regularly scheduled collection days, it shall be lawful for the occupant of any premises to place upon the sidewalk in the rear of such premises, or in front, or on the side, of premises to which rear entrance is not accessible to the drivers of the collection vehicle, suitable receptacles as prescribed by ordinance containing garbage, ashes, litter, or rubbish, and to allow the same to remain until such garbage, etc., has been duly collected; provided that no such receptacle, whether filled or empty, shall be placed or permitted to remain on any such sidewalk for a longer period than necessary under the circumstances at any particular property. Any person violating the provisions of this section shall be guilty of a misdemeanor and, upon conviction thereof, shall be subject to a fine of not more than twenty-five dollars ($25.00) for each such violation.

City Code, 1879, art. 23, sec. 99; 1893, art. 18, sec. 202; 1927, art. 44, sec. 31; 1950, art. 31, sec. 10. Ord. 399, 1948-49.

9. Neglect of duty.

It shall be the duty of the Police Commissioner to report to the said Engineer all cases of neglect or refusal of the employees of the Bureau of Sanitation or its contractors, to remove any garbage, ashes or rubbish from any premises, when the same shall be properly set out for collection and when it is the duty of said employees or contractors to remove same.

City Code, 1950, art. 31, sec. 11. Ord. 955, 1949-50, sec. 10.

10. Penalty provisions.

Any person violating the provisions of this subtitle shall, upon conviction thereof, be subject to a penalty of not more than twenty-five dollars ($25.00) for each such violation.

Ord. 159, 1959-60; Ord. 344, 1960-61.

11. Fees for collection of refuse.

The Sanitary Engineer may receive at incinerators of the Mayor and City Council of Baltimore, between the hours of 8 a.m. and 4 p.m., on days on which the Mayor and City Council shall collect refuse and mixed refuse, refuse and mixed refuse collected by persons other than the Mayor and City Council of Baltimore and use, or permit the use of, such incinerators for the dumping, burning or other disposal of the same. A charge for receipt of such refuse and mixed refuse at the rate of ten cents (10¢) per one hundred (100) pounds, or fraction thereof, with a minimum charge of one dollar ($1.00) for each single delivery, shall be collected by the Mayor and City Council of Baltimore in such manner as shall be approved by the Treasurer. Provided, however, that refuse and mixed refuse delivered to the aforementioned incinerators by individuals by means of private passenger automobiles shall be exempt from any charge. Any moneys collected, directly, by the Sanitary Engineer shall be accounted for and paid to the Treasurer, at such intervals as the Treasurer may prescribe.

Markets

City Code, 1927, art. 44, sec. 17; 1950, art. 31, sec. 12. Ord. 375, 1920-21; Ord. 736, 1911-12; Ord. 1120, 1919-50.

12. Collection of refuse.

It shall be the duty of all occupants of stalls in the City markets to place or have placed in receptacles or containers, all vegetable and animal offal or refuse, paper and other refuse; the said receptacles or containers shall be placed near the stalls or in places designated by the Market Master. It shall be unlawful for any person to throw foodstuffs, garbage, trash, paper, or other refuse, on any street running through or bordering on any of the City markets. Any person neglecting or refusing to comply with or violating any of the provisions of this section shall be liable to a penalty of not less than ten dollars ($10.00) nor more than twenty-five dollars ($25.00) for each and every offense.

Penalties

City Code, 1927, art. 44, sec. 16; 1950, art. 31, sec. 13. Ord. 564, 1918-19, sec. 9G.

13. Provisions.

Any person violating any of the provisions of this Article shall, on conviction thereof, be punished by a fine of not less than one dollar nor more than twenty-five dollars.

Refuse

City Code, 1927, art. 44, sec. 12; 1950, art. 31, sec. 14. Ord. 564, 1918-19, sec. 9D

14. Unlawful to leave.

No person shall throw, cast, deposit, drop, scatter or leave or cause to be thrown, cast, laid, deposited, scattered or left, in or upon any street, avenue, alley, highway, footway, sidewalk, parking, vacant lot or open space, public or private, in the City of Baltimore, any dead animal, offal, garbage or putrescible matter of any sort, or any other matter or thing injurious to public health.

City Code, 1927, art. 44, sec. 14; 1950, art. 31, sec. 15. Ord. 564, 1918-19, sec. 9F.

15. Burning.

No person shall burn, consume with fire, or cause to be burned or consumed with fire, any dead animal, offal, garbage, putrescible matter of any sort, likely to produce nauseating, vile or offensive smoke or vapors.

Vehicles

City Code, 1879, art. 23, sec. 96; 1893, art. 48, sec. 193; 1927, art. 44, sec. 22; 1950, art. 31, sec. 16. Ord. 1397, 1950-51, sec. 22.

16. Dead animals.

The Sanitary Engineer is authorized to have dead animals lying in the streets, lanes or alleys removed and to cause the vehicle used in their removal to be so constructed as to have covers and to be closed at all times except when such dead animals are actually being placed in the vehicles, as in his judgment may be deemed most advisable.

City Code, 1879, art. 23, sec. 96; 1893, art. 48, sec. 194; 1927, art. 44, sec. 23; 1950, art. 31, sec. 17. Ord. 1397, 1950-51, sec. 23.

17. Coverings.

All vehicles used or employed by the city for the collection of offal and coal and other ashes, shall be covered with heavy canvas or other substantial material, so as to prevent dust or other materials from escaping from such vehicles while being driven along the streets, lanes and alleys of the city.

City Code, 1893, art. 48, sec. 196; 1927, art. 44, sec. 25; 1950, art. 31, sec. 18. Ord. 38, April 28, 1891.

18. Construction.

All carts or vehicles for carrying no[illegible] or offensive substances, boxes, tubs and receptacles in which any noxious or offensive substance may be, or may be carried, shall be strong and tight, and the sides shall be so high above the load or contents that no part of such contents or load shall fall, leak or spill therefrom, and either the cart, vehicle or vessel carried by it shall be so covered as to be inoffensive.

City Code, 1893, art. 8, sec. 197; 1927, art. 44, sec. 26; 1950, art. 31, sec. 19. Ord. 38, April 8, 1891.

19. Drivers, employees.

No driver of such cart or vehicle, nor any person having undertaken or being engaged about the loading or unloading thereof; nor person engaged about the cleaning or employing or having undertaken to empty or remove any garbage, offal or any noxious or offensive substance, shall do or permit to be done about the same, or in connection therewith, that which shall be needlessly offensive or filthy in respect to any person, street, place, building or premises.

City Code, 1893, art. 48, sec. 198; 1927, art. 44, sec. 27; 1950, art. 31, sec. 20. Ord. 38, April 28, 1891.

20. Loads.

No person shall allow any cart or vehicle to be so fully loaded or being in such bad condition of repair or of such faulty construction, or being so improperly drawn or managed, that any offensive liquid or any garbage, rubbish, offal, dirt or material thereon shall fall upon or in any street, lane, alley, place or premises; and it shall be the duty of every such person to at once replace on such vehicle and remove what has so fallen.

City Code, 1893, art. 48, sec. 199; 1927, art. 44, sec. 28; 1950, art. 31, sec. 21. Ord. 38, April 28, 1891; Ord. 97, 1905-06.

21. Penalty provisions.

Any person who violates, disobeys, omits, neglects or refuses to comply with, or resists any of the provisions of Sections 18-20 shall be subject to a fine of not more than twenty dollars ($20.00) for each offense; said fine to be collected as other fines for violation of City Ordinances are collected; provided, that said sections shall apply to the removal of stable manure only so far as overloading and spilling on the streets.

City Code, 1879, art. 23, sec. 98; 1893, art. 48, sec. 200; 1927, art. 44, sec. 29; 1950, art. 31, sec. 22. Ord. 401, 1948-49.

22. Private vehicles.

The owner of every vehicle employed in removing or carrying any sand, ashes, dirt, gravel, loam, earth, manure, filth, stone, brick or coal, over any of the streets, lanes or alleys of the City, shall have and keep the same in such tight and secure condition as that such ashes, sand, dirt, gravel, loam, earth, manure, filth, stone, brick or coal or any liquids dripping or flowing from such vehicle, shall not be scattered or suffered to fall on any of the streets, lanes or alleys aforesaid, under the penalty of twenty-five dollars for each offense.

City Code, 1893, art. 48, sec. 201; 1927, art. 44, sec. 30; 1950, art. 31, sec. 23. Ord. 102, May 11, 1880; Ord. 400, 1948-49.

23. Flushing streets.

The Sanitary Engineer is empowered to use the water from fire plugs subject to the rules and regulations of the Water Engineer, in order to flush the gutters, streets, lanes, alleys and markets.

APPENDIX B: MODEL CITIES SANITATION SERVICES

MODEL CITIES AGENCY
BALTIMORE, MARYLAND

WORK PROGRAM AND BUDGET FOR SUPPLEMENTARY GRANT ACTIVITY

PROJECT: Neighborhood Sanitation Services No: HP-8

NAME AND ADDRESS OF OPERATING ENTITY:
DEPARTMENT OF PUBLIC WORKS
Bureau of Utility Operations
Sanitation Division
1200 American Building
Baltimore, Maryland 21202

TYPE OF ENTITY: City Department

A. WORK PROGRAM

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1. ASSESSMENT OF THIRD ACTION YEAR:

The major problem still remains the education of many of the Model Neighborhood Residents of the importance of keeping the area clean. Some progress has been made in this direction but not nearly enough. Emphasis is still placed on educating the people in the field of sanitation. During the Third Action Year, the Coordinator worked very closely with the Community Councils, Residents and many community organizations. The thrust of these meetings was to get the Residents to cooperate with the Sanitation Department to make sure that once the area is clean it will remain so. Since we are aware that garbage is a form of Pollution, we also stressed that good health depends on how clean we can keep the area.

Sanitation laborers are now enrolled in classes set up by the Model Cities Lighted House Project (M-2) for upgrading purposes. Release schedules have been worked out and they have received priority in accordance with the Resident Employment Plan.

Although Enforcement Officers were added in the Third Action Year, this component, as of this writing, has not yet been implemented. However, by the end of this calendar year it is expected that some progress will have been seen in this area.

2. MAJOR CHANGES:

None

3. DESCRIPTION OF SCOPE AND CONTENT:

The nature of this project is to provide increased sanitation services throughout the Model Cities area, such as were not being provided in the programs operated by the Sanitation Division of the Department of Public Works prior to its implementation. Essentially, these increased services are to consist of the following:

A. Handsweeping and cleaning three times per week of all street gutters, sidewalks and all public and private alleys;

B. Collection once per week on a regularly scheduled day of all bulky items of trash set out for removal without need for special request to the Sanitation Division (usually made by phone calls);

C. Cleaning as needed of all vacant lots, many of which are City owned;

D. Mechanical flushing once per week of all streets;

E. Emptying four times per week of all corner trash receptacles (i.e., wire baskets).

4. PURPOSE AND OBJECTIVES:

These services represent thrice the services previously provided by the Sanitation Division in the Model Cities Area. Under the Maintenance of Effort guidelines of the Model Cities Program, the Sanitation Division of the Department of public Works would continue to pay approximately one-third of the total amount of these services (See attachment for description and frequency and scheduling of services by Council area).

The Neighborhood Sanitation Services Program (HP-8) would operate six days per week. In brief, this proposal has required purchase of 31 pieces of equipment: 13 large open dump trucks, two flushers, four liftgate trucks, five cars, two mechanical sweepers and five radio units.

Employment in the Model Cities Sanitation Program will be designed to achieve a "career ladeer", with most employees entering as laborers, many moving almost immediately into Truck Driver and Gangleader positions. With further training and experience, some who came in at the bottom of the ladder will become supervisory personnel.

5. TIME TABLE:

This project is already in operation.

6. ADMINISTRATION AND ORGANIZATION:

The Neighborhood Sanitation Services Project is administered by the City's Department of Public Works. The Sanitation Division will operate the program, following prescribed guidelines as to personnel recruitment and hiring, community participation and technical assistance described herein. Emphasis on the "career ladder" provisions, training and coordination through the Project Coordinator and Community Councils, the Model Cities Agency and the Sanitation Division must be recognized as the key to the success of the project; otherwise, the program is doomed to provide a few dead end jobs to a limited number of residents and another futile attempt to clean up the inner city.

A. Sanitary Enforcement Officers

Experience has shown that a major problem area is in maintaining an adequate level of cleanliness in the neighborhoods, once the area has been cleaned. Thus, the current need is for a wide range educational and enforcement program to eliminate this problem. At present, the Divison of Sanitary Enforcement within the Baltimore City Health Department provides such a service; however, the limited scope of service precludes the possibility of an adequate enforcement program in the Model Neighborhood Area.

Thus, 6 enforcement officers have been provided for. They are directly supervised by the Health Department's Division of Sanitary Enforcement, thru close and clearly defined coordination with the Model Cities Sanitation personnel. Their duties and training are identical to that of existing City sanitary enforcement officers, except that their duties will be confined to the Model Cities Neighborhood and priority for employment in these positions is given to Model Neighborhood Residents.

7. EVALUATION:

This project will be evaluated in accordance with measures developed through the Agency's Planning and Evaluation Division.

8. CITIZEN PARTICIPATION:

In addition to its role in job recruitment, each Community Council has sponsored a committee of interested and knowledgeable residents to serve as a sanitation group for the program in the Council area. There are, perhaps, four or five members on each committee; it would plan a continuing role in the day-to-day operations of the program, assuring success to the technical assistance ambitions of the program and providing an essential monitoring device for the services and procedures. These committees will work directly with the Sanitation Coordinator assigned to the Project. As the program continues, certain modifications will be in order and these committees would afford a ready means to implement change and adjustments.

The continuing advisory format ought to stimulate consistent interest in the program and in sanitation generally, and would introduce knowledge of the technical aspects of a sanitation program. It is hoped that many of the residents who have thus become involved would be encouraged to take more direct roles in management of the program through employment by the City.

B. BUDGET

1. BUDGET SUMMARY:

A. COST CATEGORY	B. ESTIMATED COST	C. MCA SHARE (if cost is being shared with others)
(1) PERSONNEL	$ 1,058,447.03	
(2) CONSULTANTS AND CONTRACT SERVICES		
(3) TRAVEL		
(4) SPACE COSTS	30,000.00	
(5) CONSUMABLE SUPPLIES		
(6) RENTAL, LEASE OR PURCHASE OF EQUIPMENT	102,019.60	
(7) OTHER COSTS	5,525.00	
TOTAL	1,195,991.63	

2. METHOD OF ALLOCATION:

3. BUDGET JUSTIFICATION FOR PERSONNEL (COST CATEGORY 1)

MBER OF RSONS	POSITION OR TITLE	SALARY PER MONTH	PERCENT OF TIME ON UNDERTAKING	MONTHS TO BE EMPLOYED	COST
1	Superintendent	$ 940.89	100	12	$11,290.64
1	Coordinator	1,094.73	100	12	13,136.76
4	Supervisors	834.77	100	12	40,068.76
2	Mechanical Sweeper Operators	748.02	100	12	17,952.48
13	Gangleaders	689.78	100	12	107,605.68
7	Laborer Foremen	689.78	100	12	57,941.52
17	Laborer Chauffeur	635.18	100	12	129,576.72
66	Laborers	606.06	100	12	436,363.20
10	Laborers	586.04	100	12	70,324.80
6	Sanitary Enforcement Officer	501.78	100	12	36,128.16
				TOTAL	$920,388.72
				PLUS 10% FRINGE BENEFITS	138,053.3
				TOTAL PERSONNEL	$1,058,447.0

4. BUDGET JUSTIFICATION (COST CATEGORIES 2 THROUGH 7):

DESCRIPTION OF ITEM AND BASIS FOR ESTIMATED COST	AMOUNT OR VALUE OF ITEM
SEE ATTACHED SHEET	

BUDGET JUSTIFICATION 2 THROUGH 7

DESCRIPTION OF ITEM AND BASIS FOR ESTIMATED COST	AMOUNT OR VALUE OF ITEM
(4) Space Cost:	
Rental of Model Cities Garage and Yard for one year - 1870 N. Gay Street	$ 30,000.00
(6) Rental, Lease and Purchase of Equipment:	
13 Large Open Dump Trucks (45 Hours per/wk. ea. - 52 weeks @ $2.20 hr.	$ 53,539.20
2 Flushers (24 hrs. per week - 32 wks. @ $8.10 hr.	9,953.60
4 Liftgate Trucks (45 hrs. per/wk. ea. 52 wks. @ $2.35 hr.	17,596.80
5 Cars (800 miles per car per month @ 12¢ per/mi.	5,760.00
2 Sweepers (23 hrs. ea. per week - 50 weeks @ $8.00 hr.)	14,720.00
5 Radio Units ($90 per unit - flat rate)	450.00
	$ 102,019.60
(7) Other Costs:	
T-shirts - summer uniforms	$ 230.00
Rental of winter uniforms	2,200.00
Rental of Walk-off mats for office	200.00
Polaroid Film	100.00
Paper bags for hokey carts	1,000.00
Brooms, handles, shovels, etc.	600.00
Janitorial supplies	100.00
Office supplies	75.00
Telephone Services	1,020.00
	$ 5,252.00

ATTACHMENT 1: Frequency and scheduling of proposed Neighborhood Sanitation Services in the Model Cities area, PROJECT NP-8

STREET AND ALLEY CLEANING

STREETS AND ALLEYS CLEANED THREE TIMES A WEEK, ALSO SIDEWALKS

NEIGHBORHOOD COUNCIL AREAS

A - 1 open truck	2 routes
B - 3 open trucks	6 routes
D - 3 open trucks	6 routes
E - 2 1/2 open trucks	5 routes
F - 3 1/2 open trucks	7 routes
G - 8 open trucks	16 routes

Routes for Hokey Men - Clean Every Day

2 Hokey Men on Pennsylvania Avenue - North Avenue to Franklin Street

2 Hokey Men on Baltimore Street - Paca Street to Monroe Street

2 Hokey Men on Washington Boulevard - Paca Street to Monroe Street

1 Hokey Man on Edmondson Avenue - Fremont Avenue to Monroe Street

1 Hokey Man on Eutaw Place - North Avenue to Dolphin Street

1 Hokey Man on Gay Street - Fallsway to Monument Street - Monument Street - Broadway to Ensor Street - Ensor Street - Monument Street to Gay Street

BULKY TRASH COLLECTION

COLLECT WEEKLY

COUNCIL AREA

A - Monday

B - Monday

D - Tuesday

E - Wednesday

F - Thursday

G - Friday

LOT CLEANING

AS NEEDED

1 Open Truck for Council Areas A-B and D

1 Open Truck for Council Areas E-F and G

FLUSHERS

FLUSH WEEKLY

COUNCIL AREA

A - Monday and Thursday

B - Tuesday and Friday   1 Flusher

D - Wednesday and Saturday

COUNCIL AREA

E - Monday and Thursday

F - Tuesday and Friday   1 Flusher

G - Wednesday and Saturday

CITY CORNER CANS

CORNER CANS EMPTIED FOUR TIMES A WEEK

COUNCIL AREA

A - Packer on Monday and Thursday --- Open TRuck Wednesday and Saturday

B - Packer on Monday and Thursday --- Open Truck Wednesday and Saturday

D - Packer on Monday and Thursday --- Open Truck Wednesday and Saturday

E - Packer on Monday and Thursday --- Open Truck Wednesday and Saturday

F - Packer on Monday and Thursday --- Open Truck Wednesday and Saturday

G - Packer on Tuesdayand Friday --- Open Truck Wednesday and Saturday